

2021

Graduate Catalog of Studies, 2020-2021

University of Arkansas, Fayetteville

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2020-21
GRADUATE
Catalog of Studies



UNIVERSITY OF
ARKANSAS

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Graduate Catalog

Welcome to the University of Arkansas

This catalog of studies is a comprehensive reference for your years of graduate study – a list of courses and degrees offered through the Graduate School at the University of Arkansas. It offers valuable information such as suggested and required degree plans and information about costs, scholarships and financial assistance, and campus resources. Read it with pleasure and with care.

The University of Arkansas is committed to your success. The faculty and staff are here to support you as you work to achieve your goals. Ask for help and advice whenever you need it. Take every opportunity to consult your academic adviser to ensure that you are taking advantage of courses and university resources that will help you reach your educational and career goals and graduate on time.

The University of Arkansas provides educational opportunities to all qualified students regardless of their economic or social status and will not discriminate on the basis of race, color, sex, creed, sexual orientation, disability, veteran's status, age, marital or parental status, or national origin.

Courses

OPAN 5003. Introduction to Operations Analytics. 3 Hours.

An introduction to operations analytics providing an understanding of the role of analytics within operational settings. Builds basic skill instruction in descriptive analytics and the communication of analytics. An overview of introductory techniques within the field of analytics and their application. (Typically offered: Fall, Spring and Summer)

OPAN 5013. Applied Predictive Analytics. 3 Hours.

This course focuses on the fundamental theory, methodologies, algorithms and software tools for predictive analytics. The main goal is to equip the students with the basic knowledge and skills to solve common predictive analytics problems arising from various applications. Methodologies covered in this course include linear and non-linear regression, additive models, ensemble trees, model assessment and selection, Artificial Neural Network. Students will learn how to implement the methods using popular statistical computing and analytics tools. Working knowledge of multi-variate calculus based probability and statistical inference is expected. Prerequisite: OPAN 5003. (Typically offered: Fall, Spring and Summer)

OPAN 5023. Applied Prescriptive Analytics. 3 Hours.

Methods, algorithms, and techniques for optimization models used in analytics applications. Coverage includes model formulation, solution methods and the use of optimization software. Prerequisite: OPAN 5003. (Typically offered: Fall, Spring and Summer)

OPAN 5713. Simulation Analytics. 3 Hours.

An overview of Monte Carlo computer simulation methods and their application within analytics. Generation of random variates from univariate and multi-variate distributions. Probability model representation and fitting methods. Computing methods for simulating and estimating random processes. Bootstrapping procedures. Statistical reasoning and decision making under uncertainty. Working knowledge of calculus-based probability and statistics and computer programming is expected. (Typically offered: Fall and Summer)

OPAN 5903. Operations Analytics Capstone. 3 Hours.

Comprehensive analytics project. Conduct background research, data collection, and preliminary analysis; define objectives, performance measures, and deliverables; apply analytics methods, develop recommended solutions, and document solution and benefits. Course should be taken in the term prior to meeting degree requirements. Students cannot receive credit for both OPAN 5903 and OPAN 5913. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

OPAN 5913. Operations Analytics Industrial Practicum. 3 Hours.

Student must apply to enroll in this course. Students must be employed within an analytics organization in industry. Prior approval to use an organization's analytics project as the basis of the student's course project must be obtained. A project report documenting the application of analytics performed by the student within the organization is required. An evaluation by the student's supervisor on the technical aspects of the student's work will be required in addition to an evaluation by the course instructor. The student's supervisor must be an analytics professional. Course should be taken in the term prior to meeting degree requirements. Students cannot receive credit for both OPAN 5903 and OPAN 5913. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

For More Information

See the University of Arkansas Directory (<http://directory.uark.edu/>) for a more comprehensive directory of offices and personnel.

Admissions

Undergraduate Admissions	232 Silas H. Hunt Hall	479-575-5346
School of Law Admissions	110 Waterman Hall	479-575-3102
Graduate School Admissions	213 Gearhart Hall	479-575-6246
International Admissions	213 Gearhart Hall	479-575-6246

Campus Tours & Visits

Office of Admissions	232 Silas H. Hunt Hall	479-575-5346
Graduate School Admissions	213 Gearhart Hall	479-575-6246

Deans' Offices

Honors College	244 Ozark Hall	479-575-7678
Dale Bumpers College of Agricultural, Food and Life Sciences	E-202 Agricultura Food and Life Sciences Bldg	479-575-2252
Fay Jones School of Architecture	Vol Walker Hall	479-575-4945

Fulbright College of Arts & Sciences	525 Old Main	479-575-4801
Sam M. Walton College of Business	301 Business Building	479-575-5949
College of Education and Health Professions	324 Graduate Education Bldg.	479-575-3208
College of Engineering	4183 Bell Engineering Center	479-575-6012
Graduate School and International Education	213 Gearhart Hall	479-575-4401
School of Law	110 Waterman Hall	479-575-5601

Enrollment Services

Vice Provost of Enrollment and Dean of Admissions	232 Silas H. Hunt Hall	479-575-3771
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Fee Payments

Student Accounts	Arkansas Union Room 213	479-575-5651
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Financial Aid and Scholarships

Office of Financial Aid	114 Silas H. Hunt Hall	479-575-3806
Academic Scholarship Office	101 Old Main	479-575-4464

Greek Life

Walton Hall	Charles and Cappy Whiteside Greek Life Center	479-575-5001
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Honors Programs

Honors College	244 Gearhart Hall	479-575-7678
Dale Bumpers College of Agricultural, Food and Life Sciences	Dean's Office AFLS E-202	479-575-2252
Fay Jones School of Architecture	Vol Walker Hall	479-575-4945
Fulbright College of Arts & Sciences	517 Old Main	479-575-2509

Sam M. Walton College of Business	WCOB 328	479-575-4622
College of Education and Health Professions	Office of the Associate Dean, GRAD 317	479-575-4205
College of Engineering	BELL 3189	479-575-5412

Housing

University Housing	410 Arkansas Avenue	479-575-3951
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International Students

International Admissions	213 Gearhart Hall	479-575-6246
International Students and Scholars	104 Holcombe Hall	479-575-5003

New Undergraduate Student Orientation

Admissions	232 Silas H. Hunt Hall	479-575-4200
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Registration

Office of the Registrar	Main Office: 141 Uptown East (UPTE)	479-575-5451
	Campus Office: 146 Silas H. Hunt Hall (HUNT)	479-575-5451

ROTC

Air Force ROTC	319 Memorial Hall	479-575-3651
Army ROTC	207 Military Science Building	479-575-4251

Self-Paced Online Courses

Correspondence Courses

Global Campus 2 E. 479-575-3647
Center
St.,
Fayetteville

Toll Free 1-800-638-1217

Student Affairs

Vice Provost for Student 325 479-575-5007
Affairs and Dean of Students Administration
Building

Testing (ACT, CLEP, LSAT, GRE, etc.)

Toll-Free Number 1-800-377-8632

The following offices may be reached by dialing this toll-free number between 8 a.m. and 4:30 p.m. each weekday:

- Office of Admissions (undergraduate)
- Office of Scholarships and Financial Aid
- New Undergraduate Student Orientation

Transcripts, Academic Records

Office of the Registrar Main 479-575-5451
Office:
141
Uptown
East
(UPTE)

Campus 479-575-5451
Office:
146 Silas
H. Hunt
Hall
(HUNT)

University Switchboard

University Switchboard 479-575-2000

Veterans Affairs

Veterans Resource and 632 479-575-8742
Information Center Arkansas
Union

University of Arkansas

An office and building 1 Area Code: 479
address from above University
of
Arkansas
Fayetteville,
AR 72701

Fields of Study

The following graduate fields of study are offered by the Graduate School and the Graduate School of Business at the University of Arkansas:

Department of Accounting (ACCT)

- Master of Accountancy (p. 372) (ACCTMA)
- Ph.D. in Business Administration (p. 372) (ACCTPH)

Department of Agricultural Education, Communications, and Technology (AECT)

- M.S. in Agricultural & Extension Education (p. 23) (AEEDMS)
- Ph.D. in Agricultural, Food and Life Sciences with AECT Concentration (p. 17) (AFLSPH-AECT)

Department of Agricultural Economics and Agribusiness (AEAB)

- M.S. in Agricultural Economics (p. 19) (AGECMS)

Dale Bumpers College of Agricultural, Food and Life Sciences (AFLD)

- M.S. in Food Safety (p. 25) (FDFSMS)
- Ph.D. in Agricultural, Food and Life Sciences (p. 25) (AFLSPH)

Department of Animal Science (ANSC)

- M.S. in Animal Science (p. 26) (ANSCMS)
- Ph.D. in Animal Science (p. 26) (ANSCPH)

Department of Anthropology (ANTH)

- M.A. in Anthropology (p. 29) (ANTHMA)
- Ph.D. in Anthropology (p. 29) (ANTHPH)

Fay Jones School of Architecture and Design (FJAD)

- M.Des. in Design Studies (p. 107) (DSGNMDS)

School of Art (ARTS)

- M.F.A. in Art (p. 33) (ARTMFA)

Fulbright College of Arts and Sciences (ARSD)

- M.A. in Comparative Literature and Cultural Studies (p. 76) (CLCSMA) (interdisciplinary)
- Ph.D. in Comparative Literature and Cultural Studies (p. 76) (CLCSPH) (interdisciplinary)

Department of Biological and Agricultural Engineering (BAEG)

- M.S.B.E. in Biological Engineering (p. 47) (BENGMS)
- M.S.En.E. in Environmental Engineering (p. 142), in collaboration with Civil Engineering
- Ph.D. in Engineering (p. 127) (BENGPH)

Department of Biological Sciences (BISC)

- M.S. in Biology (p. 42) (BIOLMS)
- Ph.D. in Biology (p. 42) (BIOLPH)

Department of Biomedical Engineering (BMEG)

- M.S.B.M.E. in Biomedical Engineering (p. 51) (BMEGMS)
- Ph.D. in Engineering (p. 127) (BMEGPH)

Graduate School of Business

- M.Acc. in Accounting (p. 372)
- M.A. in Economics (p. 384)
- M.B.A. in Business Administration (p. 380)
- M.B.A./J.D. (p. 380), dual degree
- M.B.A./M.P.S. (p. 380) dual degree
- M.I.S. in Information Systems (p. 392)
- Ph.D. in Business Administration (p. 380)
- Ph.D. in Economics (p. 384)
- Graduate Certificates (non-degree) in the following:
 - Business (p. 380)
 - Enterprise Systems (p. 392)
 - Entrepreneurship (p. 380)

Ralph E. Martin Department of Chemical Engineering (CHEG)

- M.S.Ch.E. in Chemical Engineering (p. 60) (CHEGMS)
- Ph.D. in Engineering (p. 127) (CHEGPH)

Department of Chemistry & Biochemistry (CHBC)

- M.S. in Chemistry (p. 62) (CHEMMS)
- Ph.D. in Chemistry (p. 62) (CHEMPH)

Department of Civil Engineering (CVEG)

- M.S.C.E. in Civil Engineering (p. 65) (CVEGMS)
- M.S. in Construction Management (p. 90) (CSMGMS)
- M.S.En.E. in Environmental Engineering (p. 142) (ENEGMS)
- Ph.D. in Engineering (p. 127) (CVEGPH)

Department of Communication (COMM)

- M.A. in Communication (p. 70) (COMMA)

Department of Computer Science & Computer Engineering (CSCE)

- M.S. in Computer Science (p. 83) (CSCEMS)
- MS.Cmp.E. in Computer Engineering (p. 83) (CENGMS)
- Ph.D. in Computer Science (p. 83) (CSCEPH)
- Ph.D. in Engineering (p. 127) (CENGPH)

Department of Crop, Soil and Environmental Sciences (CSES)

- M.S. in Crop, Soil & Environmental Sciences (p. 96) (CSESMS)
- Ph.D. in Crop, Soil & Environmental Sciences (p. 96) (CSESPH)

Department of Curriculum and Instruction (CIED)

- M.A.T. in Elementary Education (p. 124) (ELEDMA)
- M.A.T. in Teacher Education (p. 321) (EDUCMA)
- M.Ed. in Career and Technical Education (p. 55) (CATEME)
- M.Ed. in Curriculum and Instruction (p. 98) (CIEDME)
- M.Ed. in Educational Equity (p. 111) (EDEQME)
- M.Ed. in Educational Leadership (p. 113) (EDLEME)
- M.Ed. in Educational Technology (p. 118) (ETECME)

- M.Ed. in Elementary Education (p. 124) (ELEDME)
- M.Ed. in Special Education (p. 310) (SPEDME)
- M.Ed. in Teaching English to Speakers of Other Languages (p. 323) (TESLME)
- Ed.S. in Curriculum and Instruction (p. 98) (CIEDES)
- Ed.S. in Educational Leadership (p. 113) (EDLEES)
- Ed.D. in Educational Leadership (p. 113) (EDLEED)
- Ph.D. in Curriculum and Instruction (p. 98) (CIEDPH)
- Graduate Certificates (non-degree) in the following:
 - Applied Behavior Analysis (p. 310) (APBAGC)
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 - Autism Spectrum Disorders (p. 310) (AUTSGC)
 - Building-Level Administration (p. 113) (PSBLMC)
 - District-Level Administration (p. 341) (PSDLMC)
 - K-12 Online Teaching (p. 118) (ETECGC)
 - Special Education Transition Services (p. 349) (SPTSGC)
 - STEM Education for Early Childhood (p. 349) (K-4) (STEMGC)

Department of Economics (ECON)

- M.A. in Economics (p. 384) (ECONMA)
- Ph.D. in Economics (p. 384) (ECONPH)

Department of Education Reform (EDRE)

- Ph.D. in Education Policy (p. 109) (EDPOPH)

Department of Electrical Engineering (ELEG)

- M.S.E.E. in Electrical Engineering (p. 119) (ELEGMS)
- Ph.D. in Engineering (p. 127) (ELEGPH)

College of Engineering (ENGR)

- M.S.E. in Engineering (p. 127) (ENGRME)
- Ph.D. in Engineering (p. 127) (ENGRPH)

Department of English (ENGL)

- M.A. in English (p. 128) (ENGLMA)
- M.F.A. in Creative Writing (p. 95) (CRWRMF)
- Ph.D. in English (p. 128) (ENGLPH)
- Graduate Certificate (non-degree) in Technical Writing and Public Rhetorics (p. 128) (TWRHGC)

Department of Entomology and Plant Pathology (ENTO-PLPA)

- M.S. in Entomology (p. 136) (ENTOMS)
- M.S. in Plant Pathology (p. 266) (PLPAMS)
- Ph.D. in Agricultural, Food and Life Sciences with (p. 137)Entomology Concentration (p. 136) (AFLSPH-ENTO)
- Ph.D. in Agricultural, Food and Life Sciences with Plant Pathology Concentration (p. 267) (AFLSPH-PLPA)

Department of Finance (FINN)

- Ph.D. in Business Administration (p. 380) (BADMPH)

Department of Food Science (FDSC)

- M.S. in Food Science (p. 144) (FDSCMS)
- Ph.D. in Food Science (p. 144) (FDSCPH)

Department of Geosciences (GEOS)

- M.S. in Geography (p. 148) (GEOGMS)
- M.S. in Geology (p. 148) (GEOOLMS)
- Ph.D. in Geosciences (p. 148) (GEOSPH)
- Graduate Certificate in Geospatial Technologies (p. 148) (GISTGC)

Department of Health, Human Performance and Recreation (HHPR)

- M.AT. in Athletic Training (p. 155) (ATTRMA)
- M.Ed. in Physical Education (p. 259) (PHEDME)
- M.Ed. in Recreation and Sport Management (p. 287) (RESMME)
- M.S. in Exercise Science (p. 143) (EXSCMS)
- Ph.D. in Health, Sport and Exercise Science (p. 158) (HSESPH)

Department of History (HIST)

- M.A. in History (p. 164) (HISTMA)
- Ph.D. in History (p. 164) (HISTPH)

Department of Horticulture (HORT)

- M.S. in Horticulture (p. 172) (HORTMS)
- Ph.D. in Agricultural, Food and Life Sciences (p. 172) with Horticulture Concentration (AFLSPH-HORT)

School of Human Environmental Sciences (HESC)

- M.S. in Human Environmental Science (p. 175) (HESCMS)

Department of Industrial Engineering (INEG)

- M.S. in Engineering Management (p. 126) (EMGTMS)
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- M.S.I.E. in Industrial Engineering (p. 181) (INEGMS)
- M.S. in Operations Analytics (p. 251) (OPAN)
- M.S.O.M in Operations Management (p. 252) (OPMGMS)
- Ph.D. in Engineering (p. 127) (INEGPH)

Interdepartmental Degree Program

- Ph.D. in Food Science (p. 144) (ANSC, FDSC, HESC, HORT)

Interdisciplinary Studies that span colleges

- M.Des. in Design Studies (p. 107) (DSGNMDS)
- M.S. in Cell & Molecular Biology (p. 56) (CEMBMS)
- M.S. in Materials Science (p. 187) (MATSMS)
- M.S. in Materials Engineering (p. 187) (MATEMS)
- M.S. in Space & Planetary Sciences (p. 306) (SPACMS)
- M.S. in Statistics and Analytics (p. 318) (STANMS)
- Ph.D. in Cell & Molecular Biology (p. 56) (CEMBPH)
- Ph.D. in Environmental Dynamics (p. 138) (ENDYPH)
- Ph.D. in Materials Science and Engineering (p. 187) (MSENPB)
- Ph.D. in Public Polic (p. 281)y (PUBPPH)
- Ph.D. in Space & Planetary Sciences (p. 306) (SPACPH)
- Graduate Certificates
 - African and African American Studies (p. 335) (AASTGC)
 - Cross-Sector Alliances (p. 341) (CSALGC)
 - Sustainability (p. 350) (SUSTGC)

Department of Information Systems (ISYS)

- M.I.S. in Information Systems (p. 392) (INSYMI)
- Ph.D. in Business Administration (p. 392) (ISYSPH)

School of Journalism and Strategic Media (JOUR)

- M.A. in Journalism (p. 185) (JOURMA)

Department of Management (MGMT)

- Ph.D. in Business Administration (p. 398) (MGMTPH)
- Graduate Certificate in Entrepreneurship (p. 380) (ENTRGC)

Department of Marketing (MKTG)

- Ph.D. in Business Administration (p. 401) (MKTGPH)

Department of Mathematical Sciences (MASC)

- M.A. in Secondary Mathematics (p. 217) (SMTHMA)
- M.S. in Mathematics (p. 217) (MATHMS)
- Ph.D. in Mathematics (p. 217) (MATHPH)

Department of Mechanical Engineering (MEEG)

- M.S.M.E. in Mechanical Engineering (p. 222) (MEEGMS)
- Ph.D. in Engineering (p. 127) (MEEGPH)

Department of Music (MUSC)

- M.M. in Music (p. 226) (MUSCMM)
- Graduate Certificate
 - Advanced Instrumental Performance (p. 226) (non-degree) (MUSCGC)

School of Nursing (NURS)

- M.S.N. in Nursing (p. 238) (NURSMS)
- D.N.P. in Nursing (p. 238) (NURSDP)

Department of Occupational Therapy (OTPD)

- O.T.D. in Occupational Therapy (p. 245) (OTDPDP)

Operations Management Program(OPMG)

- M.S.O.M. in Operations Management (p. 252) (OPMGMS)
- Graduate Certificate
 - Homeland Security (p. 346) (OMHSGC)
 - Lean Six Sigma (p. 347) (OMLSGC)
 - Project Management (p. 348) (OMPMPGC)

Department of Philosophy (PHIL)

- M.A. in Philosophy (p. 257) (PHILMA)
- Ph.D. in Philosophy (p. 257) (PHILPH)

Department of Physics (PHYS)

- M.S. in Physics (p. 260) (PHYSMS)
- Ph.D. in Physics (p. 260) (PHYSPH)

Department of Political Science (PLSC)

- M.A. in Political Science (p. 269) (PLSCMA)
- M.P.A. in Public Administration (p. 278) (PADMMP)

- J.D./M.A. Program (p. 269), dual degree
- J.D./M.P.A. Program (p. 279), dual degree

Department of Poultry Science (POSC)

- M.S. in Poultry Science (p. 272) (POSCMS)
- Ph.D. in Poultry Science (p. 272) (POSCPH)

Department of Psychological Science (PSYC)

- M.A. in Psychology (p. 275) (PSYCMA)
- Ph.D. in Psychology (p. 275) (PSCYPH)

Department of Rehabilitation, Human Resources, and Communication Disorders (RHRC)

- M.Ed. in Adult and Lifelong Learning (p. 13) (ADLLME)
- M.Ed. in Higher Education (p. 161) (HIEDME)
- M.Ed. in Human Resource and Workforce Development Education (p. 178) (HRWDME)
- M.S. in Communication Sciences and Disorders (p. 72) (CDISMS)
- M.S. in Counseling (p. 90) (CNSLMS)
- Ed.D. in Adult and Lifelong Learning (p. 13) (ADLLED)
- Ed.D. in Higher Education (p. 161) (HIEDED)
- Ed.D. in Human Resource and Workforce Development Education (p. 178) (HRWDED)
- Ph.D. in Counselor Education and Supervision (p. 90) (CNEDPH)
- Ph.D. in Educational Statistics and Research Methods (p. 116) (ESRMPH)
- Graduate Certificates (non-degree) in the following:
 - Educational Measurement (p. 116) (EDMEMC)
 - Educational Program Evaluation (p. 116) (EDEVMC)
 - Educational Psychology (p. 116) (EDPSMC)
 - Educational Statistics and Research Methods (p. 116) (EDSTMC)

School of Social Work (SCWK)

- M.S.W. in Social Work (p. 299) (SCWKMS)
- See also the J.D./M.S.W. dual degree (p. 301) program

Department of Sociology and Criminology (SOCL)

- M.A. in Sociology (p. 304) (SOCIMA)

Department of Supply Chain Management

- Ph.D. in Business Administration (p. 402) (BADMPH)

Department of Theatre (THTR)

- M.F.A. in Theatre (p. 324) (THTRMF)

Department of World Languages, Literatures and Cultures (WLLC)

- M.A. in World Languages (p. 328) (MLANMA)
- M.A. in Spanish (p. 328) (SPANMA)

University of Arkansas Clinton School of Public Service (UACS)

- M.P.S. in Public Service (p. 69) (UACSMP)
- See also the M.B.A./M.P.S. dual degree (p. 380) program

The following master's programs and specialist fields of study are offered by the Graduate School and the Graduate School of Business at the University of Arkansas:

- Accounting (p. 372), M.Acc. (ACCTMA)
- Adult and Lifelong Learning (p. 13), M.Ed. (ADLLME)
- Agricultural and Extension Education (p. 23), M.S. (AEEDMS)
- Agricultural Economics (p. 19), M.S. (AGECMS)
- Agricultural, Food and Life Sciences (p. 25), M.S. (AFLSMS)
- Animal Science (p. 26), M.S. (ANSCMS)
- Anthropology (p. 29), M.A. (ANTHMA)
- Art (p. 33), M.F.A. (ARTMFA)
- Athletic Training (p. 155), M.A.T. (ATTRMA)
- Biological Engineering (p. 47), M.S.B.E. (BENGMS)
- Biology (p. 42), M.S. (BIOLMS)
- Biomedical Engineering (p. 51), M.S.B.M.E. (BMEGMS)
- Business Administration (p. 380), M.B.A. (BADMMB)
- Career and Technical Education (p. 55), M.Ed. (CATEME)
- Cell and Molecular Biology (p. 56), M.S. (CEMBMS)
- Chemical Engineering (p. 60), M.S.Ch.E. (CHEGMS)
- Chemistry (p. 62), M.S. (CHEMMS)
- Civil Engineering (p. 65), M.S.C.E. (CVEGMS)
- Communication (p. 70), M.A. (COMMMA)
- Communication Sciences and Disorders (p. 72), M.S. (CDISMS)
- Community Health Promotion (<http://catalog.uark.edu/graduatecatalog/programsofstudy/communityhealthpromotionchlpmsph/>), M.S. (CHLPMS)
- Comparative Literature and Cultural Studies (p. 76), M.A. (CLCSMA)
- Computer Science (p. 83), M.S. (CSCEMS)
- Computer Engineering (p. 83), MS.Cmp.E. (CENGMS)
- Construction Management (p. 90), M.S. (CSMGMS)
- Counseling (p. 90), M.S. (CNSLMS)
- Creative Writing (p. 95), M.F.A. (CRWRMF)
- Crop, Soil and Environmental Sciences (p. 96), M.S. (CSESMS)
- Curriculum and Instruction (p. 98), M.Ed. (CIEDME)
- Curriculum & Instruction (p. 98), Ed.S. (CIEDES)
- Design Studies (p. 107), M.Des. (DSGNMDS)
- Economics (p. 384), M.A. (ECONMA)
- Educational Equity (p. 111), M.Ed. (EDEQME)
- Educational Leadership (p. 113), M.Ed. (EDLEME)
- Educational Leadership (p. 113), Ed.S. (EDLEES)
- Educational Technology (p. 118), M.Ed. (ETECME)
- Electrical Engineering (p. 119), M.S.E.E. (ELEGMS)
- Elementary Education (p. 124), M.A.T. (ELEDMA)
- Engineering (p. 127), M.S.E. (ENGRME)
- Engineering Management (p. 126), (EMGTMS)
- English (p. 128), M.A. (ENGLMA)
- Entomology (p. 136), M.S. (ENTOMS)

- Environmental Engineering (p. 142), M.S.En.E. (ENEGMS)
- Exercise Science (p. 143), M.S. (EXSCMS)
- Food Safety (p. 25), M.S. (FDFSMS)
- Food Science (p. 144), M.S. (FDSCMS)
- French (p. 328), M.A. (FRENMA)
- Geography (p. 148), M.S. (GEOGMS)
- Geology (p. 148), M.S. (GEOLMS)
- German (p. 328), M.A. (GERMMA)
- Higher Education (p. 161), M.Ed. (HIEDED)
- History (p. 164), M.A. (HISTMA)
- Horticulture (p. 172), M.S. (HORTMS)
- Human Environmental Science (p. 175), M.S. (HESCMS)
- Human Resource and Workforce Development Education (p. 178), M.Ed. (HRWDME)
- Industrial Engineering (p. 181), M.S.I.E. (INEGMS)
- Information Systems (p. 392), M.I.S. (INSYMI)
- J.D./M.A. dual degree (p. 269), Political Science Program
- J.D./M.B.A. dual degree (p. 398), Business Administration Program
- J.D./M.S.W. dual degree (p. 301), Social Work Program
- Journalism (p. 185), M.A. (JOURMA)
- M.B.A./M.P.S. dual degree (p. 402), Business Administration Program
- Materials Engineering (p. 187) (MATEMS)
- Materials Science (p. 187) (MATSMS)
- Mathematics (p. 217), M.S. (MATHMS)
- Mechanical Engineering (p. 222), M.S.M.E. (MEEGMS)
- Music (p. 226), M.M. (MUSCMM)
- Nursing (p. 238), M.S.N. (NURSMS)
- Operations Analytics (p. 251), M.S. (OPANMS)
- Operations Management (p. 252), M.S.O.M (OPMGMS)
- Philosophy (p. 257), M.A. (PHILMA)
- Physical Education (p. 259), M.Ed. (PHEDME)
- Physics (p. 260), M.S. (PHYSMS)
- Plant Pathology (p. 266), M.S. (PLPAMS)
- Political Science (p. 269), M.A. (PLSCMA)
- Public Administration (p. 278), M.P.A. (PADMMP)
- J.D./M.P.A. dual degree (p. 279), Public Administration Program
- Public Service (p. 69), M.P.S. (UACSMP)
- Poultry Science (p. 272), M.S. (POSCMS)
- Psychology (p. 275), M.A. (PSYCMA)
- Recreation and Sport Management (p. 287), M.Ed. (RECRME)
- Secondary Mathematics (p. 217), M.A. (SMTHMA)
- Social Work (p. 299), M.S.W. (SCWKMS)
- Sociology (p. 304), M.A. (SOCIMA)
- Space and Planetary Sciences (p. 306), M.S. (SPACMS)
- Spanish (p. 328), M.A. (SPANMA)
- Special Education (p. 310), M.Ed. (SPEDME)
- Statistics and Analytics (p. 318), M.S. (STANMS)
- Teacher Education (p. 321), M.A.T. (EDUCMA)
- Teaching Education to Speakers of Other Languages (p. 323) (TESLME)
- Theatre (p. 324), M.F.A. (THTRMF)

The following doctoral programs are offered by the Graduate School and the Graduate School of Business at the University of Arkansas:

Department of Accounting

- Ph.D. in Business Administration (p. 372) (BADMPH)

Department of Agricultural Education, Communication and Technology (AECT)

- Ph.D. in Agricultural, Food and Life Sciences with AECT Concentration (p. 17) (AFLSPH-AECT)

Dale Bumpers College of Agricultural, Food and Life Sciences (AFLD)

- Ph.D. in Agricultural, Food and Life Sciences (p. 25) (AFLSPH)

Department of Animal Science

- Ph.D. in Animal Science (p. 26) (ANSCPH)

Department of Anthropology

- Ph.D. in Anthropology (p. 29) (ANTHPH)

Department of Biological & Agricultural Engineering (BAEG)

- Ph.D. in Engineering (p. 47) (BENGPH)

Department of Biological Sciences (BISC)

- Ph.D. in Biology (p. 42) (BIOLPH)

Department of Biomedical Engineering (BMEG)

- Ph.D. in Engineering (p. 51) (BMEGPH)

Graduate School of Business

- Ph.D. in Business Administration (p. 380)
- Ph.D. in Economics (p. 384)

Department of Chemical Engineering (CHEG)

- Ph.D. in Chemical Engineering (p. 60) (CHEGPH)

Department of Chemistry & Biochemistry (CHBC)

- Ph.D. in Chemistry (p. 62) (CHEMPH)

Department of Civil Engineering (CVEG)

- Ph.D. in Engineering (p. 65) (VEGPH)

Department of Computer Science & Computer Engineering (CSCE)

- Ph.D. in Computer Science (p. 83) (CSCEPH)
- Ph.D. in Engineering (p. 83) (CENGPH)

Department of Crop, Soil & Environmental Sciences (CSES)

- Ph.D. in Crop, Soil & Environmental Sciences (p. 96) (CSESPH)

Department of Curriculum & Instruction (CIED)

- Ed.D. in Educational Leadership (p. 113) (EDLEED)
- Ph.D. in Curriculum & Instruction (p. 98) (CIEDPH)

Department of Economics (ECON)

- Ph.D. in Economics (p. 384) (ECONPH)

Program in Educational Statistics & Research Methods (ESRM)

- Ph.D. in Educational Statistics & Research Methods (p. 116) (ESRMPH)

Department of Education Reform (EDRE)

- Ph.D. in Education Policy (p. 109) (EDPOPH)

Department of Electrical Engineering (ELEG)

- Ph.D. in Electrical Engineering (p. 119) (ELEGPH)

College of Engineering (ENGR)

- Ph.D. in Engineering (p. 127) (ENGRPH)

Department of English (ENGL)

- Ph.D. in English (p. 128) (ENGLPH)

Department of Entomology and Plant Pathology (ENTO-PLPA)

- Ph.D. in Agricultural, Food and Life Sciences (p. 137) with Entomology Concentration (AFLSPH)
- Ph.D. in Agricultural Food and Life Sciences (p. 267) with Plant Pathology Concentration (AFLSPH)

Department of Finance (FINN)

- Ph.D. in Business Administration (p. 388) (BADMPH)

Department of Food Science (FDSC)

- Ph.D. in Food Science (p. 144) (FDSCPH)

Department of Geosciences (GEOS)

- Ph.D. in Geosciences (p. 148) (GEOSPH)

Department of Health, Human Performance and Recreation (HHPR)

- Ph.D. in Health, Sport and Exercise Science (p. 158) (HSEHPH)

Department of History (HIST)

- Ph.D. in History (p. 164) (HISTPH)

Department of Horticulture (HORT)

- Ph.D. in Agricultural, Food and Life Sciences (p. 172) with Horticulture Concentration (AFLSPH-HORT)

Department of Industrial Engineering (INEG)

- Ph.D. in Engineering (p. 181) (INEGPH)

Interdepartmental Degree Program

- Ph.D. in Food Science (p. 144) (ANSC, FDSC, HESC, HORT)

Interdisciplinary Studies

- Ph.D. in Cell and Molecular Biology (p. 56) (CEMBPH)
- Ph.D. in Comparative Literature and Cultural Studies (p. 76) (CLCSPH)
- Ph.D. in Environmental Dynamics (p. 138) (ENDYPH)
- Ph.D. in Materials Science and Engineering (p. 187) (MSENPH)
- Ph.D. in Public Policy (p. 281) (PUBPPH)
- Ph.D. in Space & Planetary Sciences (p. 306) (SPACPH)

Department of Information Systems (ISYS)

- Ph.D. in Business Administration (p. 392) (BADMPH)

Department of Management (MGMT)

- Ph.D. in Business Administration (p. 398) (BADMPH)

Department of Marketing (MKTG)

- Ph.D. in Business Administration (p. 401) (BADMPH)

Department of Mathematical Sciences (MASC)

- Ph.D. in Mathematics (p. 217) (MATHPH)

Department of Mechanical Engineering (MEEG)

- Ph.D. in Engineering (p. 222) (MEEGPH)

Eleanor Mann School of Nursing

- D.N.P. in Nursing (p. 238) (NURSDP)

Department of Occupational Therapy (OTPD)

- O.T.D. in Occupational Therapy (p. 245) (OTPDDP)

Department of Philosophy (PHIL)

- Ph.D. in Philosophy (p. 257) (PHILPH)

Department of Physics (PHYS)

- Ph.D. in Physics (p. 260) (PHYSPH)

Department of Political Science (PLSC)

- J.D./M.A. Program (p. 269), dual degree
- J.D./M.P.A. Program (p. 269), dual degree

Department of Poultry Science (POSC)

- Ph.D. in Poultry Science (p. 272) (POSCPH)

Department of Psychological Science (PSYC)

- Ph.D. in Psychology (p. 275) (PSCYPH)

Department of Rehabilitation, Human Resources, & Communication Disorders (RHRC)

- Ed.D. in Adult and Lifelong Learning (p. 13) (ADLLED)
- Ed.D. in Higher Education (p. 161) (HIEDED)
- Ed.D. in Human Resource and Workforce Development Education (p. 178) (HRWDED)
- Ph.D. in Counselor Education and Supervision (p. 90) (CNEDPH)
- Ph.D. in Educational Statistics and Research Methods (p. 116) (ESRMPH)

Department of Supply Chain Management

- Ph.D. in Business Administration (p. 402) (BADMPH)

The following graduate certificate programs are offered by the University of Arkansas Graduate School:

Graduate School of Business

- Business (p. 380)
- Enterprise Systems (p. 392)
- Entrepreneurship (p. 380)

Department of Computer Science and Computer Engineering (CSCE)

- Cybersecurity (p. 341) (CYBRGC)

Department of Curriculum & Instruction (CIED)

- Applied Behavior Analysis (p. 310) (APBAGC)
- Arkansas Curriculum/Program Administrator (p. 337) (ACPAMC)
- Autism Spectrum Disorders (p. 310) (AUTSGC)
- Building-Level Administration (p. 338) (PSBLMC)
- District-Level Administration (p. 341) (PSDLMC)
- K-12 Online Teaching (p. 118) (ETECGC)
- Special Education Transition Services (p. 349) (SPTSGC)
- STEM Education for K-6 (p. 349) (STEMGC)
- Teaching English to Speakers of Other Languages (p. 350) (TESLGC)

Department of English

- Technical Writing and Public Rhetorics (p. 128) (TWRHGC)

Program in Educational Statistics & Research Methods (ESRM)

- Educational Psychology (p. 116) (EDPSMC)
- Educational Statistics & Research Methods (p. 116) (EDSTMC)

Department of Geosciences

- Geospatial Technologies (p. 148) (GISTGC)

Department of Industrial Engineering

- Homeland Security (p. 346) (OMHSGC)
- Lean Six Sigma (p. 347) (OMLSGC)
- Project Management (p. 348) (OMPMGC)

Interdisciplinary Studies

- African and African American Studies (p. 335) (AASGTC)
- Cross-Sector Alliances (p. 341) (CSALGC)
- Statistics and Analytics (p. 349) (STANGC)
- Sustainability (p. 350) (SUSTGC)

Department of Music (MUSC)

- Advanced Performance (p. 226) (MUSCGC)
- Music Education for Special Needs Students (p. 347) (MESNGC)

Operations Management Program

- Homeland Security (p. 346) (OMHSGC)
- Lean Six Sigma (p. 347) (OMLSGC)
- Project Management (p. 348) (OMPMGC)

Department of Rehabilitation, Human Resources and Communication Disorders (RHRC)

- Advanced School-Based Speech Language Pathology (p. 335) (ASLPMC)

School of Law

- Business Law (p. 338) (BLAWGC)
- Criminal Law (p. 339) (CRLWGC)

Professional Licensure Disclosure Policy

In compliance with federal regulation 34 CFR 668.43 (a) (5) (v) and 34 CFR 668.43 (c), the University will disclose to a student whether the student's declared degree or certificate program leads to the ability to obtain a professional license in the state of the student's self-reported *location*. Disclosure will occur prior to the student making a *financial commitment to the institution*. To facilitate this timeline, notification will be made following the student's initial enrollment in courses in a term to which the student has been admitted or readmitted to the university.

Once enrolled in a program, if the institution makes a later determination that the program does not meet educational requirements for licensure or certification in the state where the student is located, the University of Arkansas will provide notice directly to the student within 14 calendar days of making that determination.

General disclosures on professional licensure status in each state will be maintained on the University of Arkansas website.

For the purpose of this policy, the following definitions apply:

Location means the state in which the student reports they will be physically located while completing the student's program of study, also known as the reported "local" or "campus" address. Location will be designated in the first term of enrollment in coursework and will be updated upon receipt and processing of any formal notification by the student to the university of a change in location.

Financial commitment to the institution means the payment of or agreement to pay registration related tuition, fees, and charges.

Adult and Lifelong Learning (ADLL)

Michael Hevel
 Department Head, Rehabilitation, Human Resources and Communication Disorders
 100 Graduate Education Building
 479-575-4758
 Email: hevel@uark.edu

Kenda Grover
 ADLL M.Ed. Program Coordinator
 104 Graduate Education Building
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 Email: kgrover@uark.edu

Kit Kacirek
 ADLL Ed.D. Program Coordinator
 120 Graduate Education Building
 479-575-2675
 Email: kitk@uark.edu

Adult and Lifelong Learning Website (<http://adll.uark.edu>)

Degrees Conferred:
 M.Ed., Ed.D. (ADLL)

The Adult and Lifelong Learning curriculum is designed to prepare scholars/practitioners for instructional leadership roles. Coursework focuses on the assessment, design, and implementation of educational programs for adult learners across diverse developmental stages. Adult and Lifelong Learning scholars/practitioners work with specialized groups of adults including those with less than secondary (high school equivalent) education, adult learners in postsecondary education, participants in educational programs offered by community and nonprofit agencies, and participants in professional education programs.

Graduates of the degrees in Adult and Lifelong Learning are employed as instructors, coordinators, and directors of adult education and lifelong learning programs within adult literacy and general education, leisure learning, community and nonprofit organizations, extension education, military education, postsecondary education, and continuing professional education programs.

Requirements for M.Ed. in Adult and Lifelong Learning

Prerequisites for Acceptance to the Master of Education Degree

Program: In addition to submitting an application for admission and an application fee to the Graduate School, students must meet all graduate school requirements for admission with the exception of standardized tests. All students seeking admission to the M.Ed. program in Adult and Lifelong Learning must submit (1) a program application that is located on the ADLL website (<http://adll.uark.edu>), and (2) a current resume.

Requirements for the Master of Education (M.Ed.) Degree: (Minimum 33 hours)

Completion of 3 semester hours in the area of research and statistics	3
ESRM 5013 Research Methods in Education or ESRM 53: Statistics in Education and Health Professions	
Completion of 15 semester hours of Adult Education Core	15
ADLL 5113 Perspectives in Adult Education	
ADLL 5123 Principles and Practices of Adult Learning	
ADLL 5133 Curriculum Development in ABE and ASE	
ADLL 5143 Instructional Strategies and Assessment in Adult Education	
ADLL 5153 Organization and Administration of Adult and Lifelong Learning Programs	
Completion of 12 semester hours of Adult and Lifelong Learning electives	12
Choose from among:	
ADLL 5163 Managing Change in Adult and Lifelong Learning	
ADLL 5173 Program Planning	
ADLL 5183 Technology and Innovation in Adult Learning	
ADLL 5193 Seminar in Adult and Lifelong Learning	
ADLL 5213 Adult and Lifelong Learning Internship	

Completion of 3 hours of Capstone Course	3
ADLL 5223 Adult and Lifelong Learning Applied Project	
A cumulative grade point average of at least 3.00 on all course work for the degree. No grades below 'C' will be accepted toward this degree.	
Satisfactory performance on a written comprehensive examination in ADLL 5223 Adult and Lifelong Learning Applied Project, the capstone course for the degree program.	
<hr/> Total Hours	<hr/> 33

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Requirements for Ed.D. in Adult and Lifelong Learning

Prerequisites for Acceptance to the Doctor of Education Degree

Program: The Ed.D. in Adult and Lifelong Learning is a cohort-based program; applications are accepted approximately four months prior to the beginning of each cohort cycle. Cohort cycles begin approximately every two years. The anticipated timeline for program cohorts and application deadlines will be posted on the program's website (<http://adll.uark.edu>).

Students seeking admission to the Ed.D. program in Adult and Lifelong Learning must complete procedures that include (1) prior admission to the University of Arkansas Graduate School, which requires a separate application process; (2) a completed Adult and Lifelong Learning Application for Admission form; (3) a current resume or vitae; (4) an autobiographical sketch; (5) a Graduate Record Examination (GRE) score; and (5) a personal interview with members of the Adult and Lifelong Learning faculty.

Adult and Lifelong Learning faculty consider several factors when reviewing applicants for admission to the program, including professional experience related to adult and lifelong learning, demonstration of interest in a career in adult education and lifelong learning, grade point average on all graduate work completed, and Graduate Record Examination (GRE) composite scores (verbal, quantitative, and analytical writing) that demonstrate the student's ability to effectively perform academically at the doctoral level (test scores usually no lower than the 50th percentile).

Requirements for the Doctor of Education Degree: (Minimum 96 hours)

Completion of 15 semester hours in the area of research and statistics	15
ESRM 6403 Educational Statistics and Data Processing	
ADLL 6413 Quantitative Reasoning II in Adult and Lifelong Learning or ESRM 6623	
ADLL 6423 Qualitative Reasoning in Adult and Lifelong Learning or ESRM 65: Qualitative Research	
ADLL 6433 Program Evaluation or ESRM 66: Evaluation of Policies, Programs, and Projects	
ADLL 6443 Adult and Lifelong Learning Dissertation Seminar	
Completion of 21 semester hours of Adult and Lifelong Learning Core	21
ADLL 6113 Advanced Adult Learning Theory	

ADLL 6123	Leadership and Ethics in Adult and Lifelong Learning	
ADLL 6133	Analysis of International Adult and Lifelong Programs	
ADLL 6143	Instructional Adaptation and Innovation in Adult and Lifelong Learning	
ADLL 6153	Policy and Public Governance of Adult and Lifelong Learning Programs	
ADLL 6163		
Completion of Adult and Lifelong Learning Electives (as needed to meet degree hour requirements)		
ADLL 6173	Current Issues	
ADLL 6313	Independent Study ¹	
Completion of 18 semester hours of Dissertation Research		18
ADLL 700V	Doctoral Dissertation	

A minimum grade point average of 3.25 on all course work presented as part of the degree program.

Satisfactory completion of all requirements governing the candidacy examination, the dissertation, and the final oral dissertation defense.

¹ Students who do not hold a master's degree in adult education may select applicable electives from course work in the M.Ed. Adult and Lifelong Learning program or may take courses from related areas of study with adviser consent.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Grover, Kenda Shea, Ed.D. (University of Arkansas), M.S., B.A. (Northeastern State University), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2003.

Kacirek, Kit, Ed.D., M.Ed. (University of Arkansas), B.S. (University of Texas), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 1997.

Roessger, Kevin, Ph.D., M.S., B.A. (University of Wisconsin-Milwaukee), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2016.

Courses

ADLL 5113. Perspectives in Adult Education. 3 Hours.

Historical overview of the evolving field of adult education and lifelong learning in responsibilities of adult education providers and reviews the expansion of adult and lifelong learning opportunities associated with societal and demographic shifts. (Typically offered: Fall and Spring)

ADLL 5123. Principles and Practices of Adult Learning. 3 Hours.

Overview of the adult learner including characteristics, motivation for participating in learning, and strategies for developing educational programs for diverse adult populations. (Typically offered: Fall and Summer)

ADLL 5133. Curriculum Development in ABE and ASE. 3 Hours.

Curriculum development in Adult Basic Education (ABE) and Adult Secondary Education (ASE) settings including the various educational functioning levels, measures to assess student levels, selection of teaching materials, and development of curriculum utilizing instructional standards for ABE and ASE programs. (Typically offered: Fall)

ADLL 5143. Instructional Strategies and Assessment in Adult Education. 3 Hours.

Selection and utilization of materials and instructional methods for use in adult learning settings. Evaluative strategies to develop or select appropriate tools and techniques predicated upon the needs and goals of adult learners. (Typically offered: Spring)

ADLL 5153. Organization and Administration of Adult and Lifelong Learning Programs. 3 Hours.

Legal, ethical, staffing, and financial considerations for the development and implementation of programs for adult and lifelong learners in various programs including literacy centers, GED centers, community education, lifelong/leisure learning, and postsecondary education. (Typically offered: Spring)

ADLL 5163. Managing Change in Adult and Lifelong Learning. 3 Hours.

Strategies for planning, organizing, and facilitating change in programs that serve adult learners from diverse populations, across varied developmental stages and geographic locations. Discussion of social change that has impacted adult education and analysis of change models relevant to individuals, groups and organizations. (Typically offered: Fall and Summer)

ADLL 5173. Program Planning. 3 Hours.

Program development process for adult and lifelong learners. Overview of assessment, developing program objectives, identifying resources, and designing program plans. (Typically offered: Summer)

ADLL 5183. Technology and Innovation in Adult Learning. 3 Hours.

Techniques for designing, developing, implementing, and assessing technology-mediated adult and lifelong learning programs. Discussion of issues relevant to the use of innovative strategies for delivering instruction via emerging technologies and their potential impact on content and learning outcomes. (Typically offered: Summer)

ADLL 5193. Seminar in Adult and Lifelong Learning. 3 Hours.

Seminars focused on topics related to adult and lifelong learning. (Typically offered: Spring and Summer)

ADLL 5213. Adult and Lifelong Learning Internship. 3 Hours.

Internship in adult and lifelong learning settings. (Typically offered: Fall and Spring)

ADLL 5223. Adult and Lifelong Learning Applied Project. 3 Hours.

Development and Implementation of a project focused on adult and lifelong learning. Consent of advisor/instructor required. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

ADLL 5233. Independent Study. 3 Hours.

Provides students with an opportunity to pursue special study in adult and lifelong learning. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ADLL 6113. Advanced Adult Learning Theory. 3 Hours.

Advanced study of theories and models of adult and lifelong learning with an emphasis on current trends, recent research, and issues affecting the field. Issues covered will include critical theory and advancements in neuroscience and cognition as they relate to adult learning and lifespan development. (Typically offered: Irregular)

ADLL 6123. Leadership and Ethics in Adult and Lifelong Learning. 3 Hours.

This doctoral course focuses on leadership principles and ethical considerations that are critical to developing and sustaining adult education programs that benefit individuals, organizations, and communities. Course content will include case study analysis and lectures from scholar-practitioners from the field. (Typically offered: Irregular)

ADLL 6133. Analysis of International Adult and Lifelong Programs. 3 Hours.

Survey of the historical and philosophical events which have shaped adult and lifelong learning worldwide. Discussion of issues affecting adult education and lifelong learning including globalization, educational access, and variance in national policies. (Typically offered: Irregular)

ADLL 6143. Instructional Adaptation and Innovation in Adult and Lifelong Learning. 3 Hours.

An overview of teaching and learning methods, styles, and techniques which are applicable when facilitating adult learners across diverse settings. Content to include teaching and learning style assessment, accommodating learning styles, physical and learning disabilities, language differences and cultural norms. (Typically offered: Irregular)

ADLL 6153. Policy and Public Governance of Adult and Lifelong Learning Programs. 3 Hours.

Policy analysis and public governance issues in adult and lifelong learning with emphasis on state and federal programs. Discussions of how to evaluate, design, and implement policy focused on promoting adult and lifelong learning activities in a myriad of organizations. Overview of trends and current issues related to policy and public governance of adult and lifelong learning. (Typically offered: Irregular)

ADLL 6173. Current Issues. 3 Hours.

Exploration and discussion of current issues relative to adult education and lifelong learning. Focus on the review and application of current research as it relates to practice. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ADLL 6183. Organization Development, Learning, and Change. 3 Hours.

Using a system perspective, this course examines the theories and practices associated with organization development, learning and change to understand the dynamic nature of organizational life. This course examines the structural frame, the human resource frame, the political frame, and the symbolic frame that influences organizational behavior and learning. The course investigates strategies and best practices for managing and leveraging this dynamism to build organizational capacity and improve performance. (Typically offered: Fall and Spring)

ADLL 6213. Signature Pedagogy: Teaching and Learning in Community Colleges. 3 Hours.

Using a learning-centered change model, this course examines how community colleges can shift from a traditional teaching-centered paradigm to one that is learning-centered. This course examines the context of the learning college, strategic planning for a learning-outcomes approach to governance, the role of student development and technology in the learning college, and implementing and assessing learning-centered strategies. (Typically offered: Irregular)

ADLL 6223. Workforce and Community Development. 3 Hours.

This course provides an overview of how community colleges influence workforce, economic, and community development through their education missions. The course will examine the community college's expanding role in economic and community development through workforce development programs. Emphasis will be placed on program structure, best practices in program development, and partnerships and collaboration with various stakeholders. (Typically offered: Irregular)

ADLL 6233. Survey and Significance of the American Community College. 3 Hours.

A comprehensive overview of the American community college, its history, its ever-evolving purpose and the challenges it faces. Course content will focus on the administrators and faculty who lead, the students they serve, and components such as developmental education, integrative education and transfer education. Discussion will include occupational and community education and issues related to accountability. Special attention will be paid to how this unique and complex institution remains relevant and significant to the community. (Typically offered: Irregular)

ADLL 6243. Current Trends in Community Colleges. 3 Hours.

This course examines environmental factors that influence the organization and administration of community colleges. Trends related to funding, policy, staffing, and workforce development are examined and contextualized to the evolving community college mission. (Typically offered: Irregular)

ADLL 6253. Professional Development in Adult and Lifelong Learning. 3 Hours.

This course examines career planning and development, performance management, and professional development in various settings. The focus of the course will be on concepts associated with Human Resource Development (HRD) and developing employees within an organization, as well as leading adults in transition in the community and in educational settings through the process of making career decisions. (Typically offered: Irregular)

ADLL 6313. Independent Study. 3 Hours.

Independent study of topics in adult and lifelong learning. (Typically offered: Irregular)

ADLL 6403. Quantitative Reasoning I for Adult Educators. 3 Hours.

Introduction to quantitative reasoning for educators and researchers in adult education. Topics include applying the hypothetico-deductive research process, describing data using statistical terminology, building statistical models, presenting data meaningfully, and using SPSS to analyze data from practical research problems. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. (Typically offered: Fall and Spring)

ADLL 6413. Quantitative Reasoning II in Adult and Lifelong Learning. 3 Hours.

Methodologies for designing descriptive, correlational, and experimental studies. Development of research questions, definition of variables, selection or development of instruments, data collection, analysis, interpretation and reporting of research results. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or equivalent. (Typically offered: Fall)

ADLL 6423. Qualitative Reasoning in Adult and Lifelong Learning. 3 Hours.

Methodologies for designing qualitative research studies in adult and lifelong learning settings. Selection of the appropriate qualitative tradition, selection of research subjects, development of data collection protocols, field work strategies, data analysis, data interpretation and presentation of data results. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. (Typically offered: Spring)

ADLL 6433. Program Evaluation. 3 Hours.

Overview of evaluation strategies in adult and lifelong learning programs that include: development of evaluation questions, selection or development of instrumentation, data collection methods, data analysis, and reporting of evaluation results. Emphasis on practical and ethical issues associated with evaluation processes. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or ADLL 6413 or ADLL 6423, or equivalent. (Typically offered: Spring)

ADLL 6443. Adult and Lifelong Learning Dissertation Seminar. 3 Hours.

Development of dissertation proposal. Formation of research question, selection of methodologies, development of problem statement, research questions, and identification of research variables, constructs of phenomena. Identification of data collection and data analysis procedures. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or ADLL 6413 or ADLL 6423 or ADLL 6433, or equivalent. (Typically offered: Spring)

ADLL 6463. Advanced Qualitative Reasoning in Adult and Lifelong Learning. 3 Hours.

This qualitative methods course provides students with advanced instruction in qualitative data collection, field observations, records research, data analysis, and data display. In addition to reviewing various research studies that demonstrate different qualitative research approaches, students will practice some of the activities associated with executing a qualitative research study. Prerequisite: ADLL 6423 or instructor consent. (Typically offered: Irregular)

ADLL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Agricultural Education, Communication and Technology (AECT)

George W. Wardlow
Department Head
205 Agriculture Building
479-575-2035
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Donna Graham
Graduate Coordinator
E108 AFLS
479-575-2035
Email: dgraham@uark.edu

Agricultural Education, Communications and Technology Website (<http://aeed.uark.edu/>)

Degree Awarded:

Ph.D. in Agricultural, Food and Life Sciences with Agricultural Education, Communication and Technology Concentration (AFLSPH-AECT)

Program Description: The Department of Agricultural Education, Communications and Technology offers a concentration for the interdisciplinary Ph.D. program in Agricultural, Food and Life Sciences. Faculty from across Bumpers College prepare students for the wider array of natural and social sciences while allowing the student to develop a tailored degree program through the Agricultural Education, Communication and Technology Concentration.

Requirements for Ph.D. in AFLS with Agricultural Education, Communication and Technology Concentration

Prerequisites to Degree Program: A Master of Science degree is desirable. A student with a Bachelor of Science and an exceptional record in academics and/or research may be approved for admission to the Ph.D. program in Agricultural, Food and Life Sciences if the Graduate Student Concentration Admissions Committee of the desired concentration deems them qualified and approval is granted by the AFLSPH Steering Committee. A student admitted to the University of Arkansas, pursuing an M.S. and in good academic standing may apply to be admitted to the doctoral program and forgo completing the M.S. degree if so approved by the AFLSPH Steering Committee and the AFLSPH Graduate Concentration Admissions Committee. A minimum grade point average of 3.00 (on a 4.00 scale) on previous college-level course work is required.

Admission Requirements for Entry: To be considered for admission, a student must submit a letter of intent, along with the application for admission indicating the desired degree concentration, areas of interest and career goals. Official transcripts of all previous college-level course work must be submitted. Three letters of recommendation are required. These letters should address the character and academic capability of the applicant. Applications will first be reviewed by the AFLSPH Steering Committee which will assign the student to the appropriate Graduate Student Concentration Admissions Committee for review. The Concentration Admissions Committee will make the final determination of admittance into the AFLSPH program and the concentration.

Requirements for Doctor of Philosophy Degree: The Ph.D. program in Agricultural, Food and Life Sciences requires a minimum of 72 credit hours after a Bachelor of Science or Bachelor of Arts degree or a minimum of 42 hours after a Master of Science or Master of Arts degree.

General course requirements for each degree candidate are arranged on an individual basis by the Faculty Adviser, the Graduate Advisory Committee and the candidate in accordance with guidelines of their concentration. Alternate courses may be selected at the discretion of the committee.

All students must complete 6 hours of elective course hours and 2 hours of seminar. One seminar must be a research proposal presentation and the other must be an exit seminar presenting the dissertation research results. All students must complete 18 hours of doctoral dissertation hours. Students entering the doctoral program with only a B.S. or B.A. must also complete an additional 30 hours (to reach the 72 hour post B.S./B.A. requirement). Students must satisfactorily pass written and oral candidacy examinations covering their discipline and supporting areas. These examinations must be completed at least one year before completion of the Ph.D. degree program in Agricultural, Food and Life Sciences. Each candidate must complete a doctoral dissertation on an important research topic in the concentration field. The specific problem and subject of the dissertation is determined by the faculty adviser, the student and the Graduate Advisory Committee. A dissertation title must be submitted to the dean of the Graduate School at least one year before the dissertation defense. Provisional approval of the dissertation must be given by all members of the Graduate Advisory Committee prior to the dissertation defense. Students must pass the oral defense and examination of the dissertation given by the Graduate Advisory Committee. A student cannot be approved for conferral of the doctoral degree until after completion of all coursework, written and oral candidacy exams, the defense passed and dissertation accepted by the Graduate School and an application for the degree has been filed with the Registrar's Office and the fee paid.

Additional Concentration Requirements

In addition to the general requirements for the Ph.D. program in Agricultural, Food and Life Sciences, students in the Agricultural Education, Communication and Technology Concentration must also complete:

Professional 3
seminar
credits related
to research
and teaching

Graduate credits related to research and/or data analysis (qualitative and quantitative research methods)	9
Graduate-level courses related to theory appropriate to the student's discipline	3
Graduate-level elective credits as appropriate to the discipline	6
Externship credit to be performed outside of the Department of Agricultural Education, Communication and Technology	6

Courses

AGED 5001. Seminar. 1 Hour.

Presentations and discussion of graduate student research as well as review of current literature and topics of current interest by students and faculty. All graduate students will make at least one formal presentation. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

AGED 5013. Advanced Methods in Agricultural Mechanics. 3 Hours.

Emphasis on shop organization and management, courses of study, unit shop instruction, and development of skills in agricultural mechanics. (Typically offered: Summer Odd Years)

AGED 5053. Philosophy of Agricultural and Extension Education. 3 Hours.

An examination and analysis of social and economic events leading to the establishment and maintenance of federal, state, county, and local agricultural education programs. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Spring)

AGED 510V. Special Problems. 1-6 Hour.

Individual investigation of a special problem in agricultural education which is not available through regular courses. These will be directed by a member of the graduate faculty. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

AGED 5113. Undergraduate Researchers Improving Student Experiences. 3 Hours.

To engage students in the social sciences in action research that serves to solve a problem or answer a question within the student's academic field through scientific inquiry. All students will work with professionals, commonly outside of the university, within their discipline to conduct their action research in order to solve a problem experienced by that professional. Students may work in teams or individually to complete the overall purpose of the course. Prerequisite: AGED 5463 or HESC 5463 or other instructor approved Research Methods course. (Typically offered: Spring)

AGED 520V. Special Topics in Agricultural and Extension Education. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in agriculture education. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

AGED 5443. Principles of Technological Change. 3 Hours.

(Formerly AGED 4443.) This course introduces a structured approach for dealing with the organizational and human aspects of technology transition, including the key concepts of resistance and change management, organizational change, communications, and processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. This course may be offered as a web-based course. Graduate degree credit will not be given for both AGED 4443 and AGED 5443. (Typically offered: Fall Odd Years)

AGED 5463. Research Methodology in the Social Sciences. 3 Hours.

Logical structure and the method of science. Basic elements of research design; observation, measurement, analytic method, interpretation, verification, presentation of results. Applications to research in economic or sociological problems of agriculture and human environmental sciences. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with HESC 5463.

AGED 5473. Interpreting Social Data in Agriculture. 3 Hours.

The development of competencies in analyzing, interpreting and reporting the results of analyses of social science data in agriculturally related professions. Students will select appropriate analysis techniques and procedures for various problems, analyze data, and interpret and report the results of statistical analyses in narrative and tabular form. (Typically offered: Fall)

AGED 5483. Technical Communication in the Social Sciences. 3 Hours.

This course will provide students with the basic principles and techniques in communicating social science information relevant to human subject research in agriculture, natural resources, and life sciences to the general public. Communication processes covered in the course include audience identification, writing, editing, and production of social science-based materials for popular and refereed publications. Focus will also be placed on thesis preparation and writing and research manuscript development and dissemination of social science research. Web delivered course. Prerequisite: Graduate standing. (Typically offered: Spring)

AGED 5493. Survey Design and Scale Development. 3 Hours.

This course is designed to provide the expertise required to design and conduct survey research. Students will understand the instruments (scales/questionnaire) used in data collection processes and acquire the statistical skills necessary to develop and test these survey instruments. This course uses both theory and practice. Hands-on training will be provided via SPSS package for data analyses, and Qualtrics will be used for web-based surveys. Prerequisite: 3 hours of graduate level statistics coursework and HESC 5463 or AGED 5463 or instructor consent. (Typically offered: Summer)

This course is cross-listed with HESC 5053.

AGED 5563. Thesis Proposal Development. 3 Hours.

The purpose of this course is to assist graduate students in the preparation of their thesis research proposal. Students will produce the first three chapters of their thesis by the end of the course. Prerequisite: AGED 5463 or HESC 5463. (Typically offered: Fall)

AGED 5632. Teaching Diverse Populations in Agricultural and Extension Education. 2 Hours.

(Formerly AGED 4632.) This course is designed to provide pre-service teachers of agriculture with an understanding of teaching diverse populations as applied to problems of practice in agricultural and extension education. Graduate degree credit will not be given for both AGED 4632 and AGED 5632. (Typically offered: Spring)

AGED 575V. Internship in Agricultural Education. 1-6 Hour.

Scheduled practical field experiences under supervision of a professional practitioner in off-campus secondary school systems. Emphasis includes classroom preparation, teaching, and student evaluation. (Typically offered: Fall, Spring and Summer)

AGED 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with FDSC 5993, HORT 5993.

AGED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Agricultural Economics and Agribusiness (AEAB)

John D. Anderson
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217 Agriculture Building
479-575-2281
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Agricultural Economics and Agribusiness Website (<http://agribus.uark.edu/>)

Degree Conferred:

M.S. in Agricultural Economics (AGEC)

Areas of Concentration: Agricultural Economics, Agribusiness, Atlantis, and International Agribusiness.

Primary Areas of Faculty Research: Agribusiness, agricultural cooperatives, agricultural finance, agricultural marketing, agricultural outlook, agricultural policy, agricultural production, applied econometrics, delta crops (rice, soybeans, wheat, cotton), economic development, farm management, food policy, food marketing, global marketing, integrated pest management, international trade, managerial economics, market infrastructure and development, natural resource management, product development, production economics, public finance, risk management.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.S. in Agricultural Economics with Agricultural Economics Concentration

Admission Requirements: All applicants to the graduate program must submit official scores from either the Graduate Record Exam (GRE) or

Graduate Management Admission Test (GMAT), although GRE scores are preferred.

Requirements for the Master of Science Degree in Agricultural Economics (Thesis): (Minimum 31 hours.)

Prerequisites to the Thesis Concentration:**Prerequisites to the Thesis Concentration**

Six semester hours of mathematics (College Algebra and Survey of Calculus or above)	6
Three semester hours of statistics	3
Six semester hours of upper level (junior or senior) micro- and macro-economic theory	6
Three semester hours of upper-level management	3
Three semester hours of upper-level marketing	3
Three semester hours of introductory accounting.	3
Total Hours	24

Core Requirements

AGED 5103	Agricultural Microeconomics	3
AGED 5403	Quantitative Methods for Agribusiness	3
AGED 5613/ ECON 6613	Econometrics	3
AGED 5623	Quantitative Food and Agricultural Policy Analysis	3
AGED 600V	Master's Thesis	6
AGED 5011	Seminar	1
Agricultural Economics Electives		6

Students must take six hours of other graduate courses in Agricultural Economics.

Controlled Electives 6

Other graduate courses in Agricultural Economics
Graduate courses in the Walton College of Business
Other graduate courses

Other Requirements

A minimum of 16 hours of Agricultural Economics.
A maximum of 9 hours of AGECEC graduate-level courses may be completed from a) those courses also offered as 4000-level undergraduate classes, and/or b) courses numbered 4000 or lower that do not have a corresponding graduate offering.

Total Hours 31

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.S. in Agricultural Economics with Agribusiness Concentration

Requirements for the Master of Science Degree in Agricultural Economics (Agribusiness Concentration, Non-thesis): (Minimum 31 hours)

Prerequisites to the Non-thesis Concentration:

Six semester hours of mathematics (College Algebra and Survey of Calculus or Finite Mathematics or above)	6
Three semester hours of statistics	3
Six semester hours of lower division economic theory (micro & macro)	6
Three semester hours of upper-level management	3

Three semester hours of upper-level marketing	3
Three semester hours of introductory accounting	3
Total Hours	24

Core Requirements

Choose one of the following:	3
AGEC 5113 Agricultural Prices and Forecasting	
AGEC 5073 Basis Trading: Applied Price Risk Management	
AGEC 5303 Agricultural Marketing Theory	
AGEC 5083 Basis Trading: Case Study	
AGEC 5603 Food Economics and Health (AGEC 5603 may only be used once to meet program requirements)	
AGEC 5011 Seminar	1
AGEC 5103 Agricultural Microeconomics	3
Choose one of the following:	3
AGEC 5123 AgriBusiness Entrepreneurship	
AGEC 5143 Financial Management in Agriculture	
AGEC 5043 Agricultural Finance	
AGEC 5213 Agricultural Business Management	
AGEC 5413 Agribusiness Strategy	
AGEC 5403 Quantitative Methods for Agribusiness	3

Take two of the following courses: 6

AGEC 5063 Agricultural and Rural Development	
AGEC 5233 Political Economy of Agriculture and Food	
AGEC 5223 International Agricultural Trade and Commercial Policy	
AGEC 5153 The Economics of Public Policy	
AGEC 5133 Agricultural and Environmental Resource Economics	
AGEC 5623 Quantitative Food and Agricultural Policy Analysis	
AGEC 5603 Food Economics and Health (AGEC 5603 may only be used once to meet program requirements)	

Controlled Electives 12

AGEC 503V Internship in Agricultural Economics	
Other Graduate Courses in Agricultural Economics	
Graduate Courses in the Walton College of Business	
Other Graduate Courses	

Other Requirements

A maximum of 9 hours of AGEC graduate-level courses may be completed from a) those courses also offered as 4000-level undergraduate classes, and/or b) courses numbered 4000 or lower that do not have a corresponding graduate offering.

Minimum of 16 hours in Agricultural Economics

Total Hours	31
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Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.S. in Agricultural Economics with Atlantis Concentration

Requirements for the Master of Science Degree in Agricultural Economics (U.S.-E.U. Atlantis Double Degree in Agricultural Economics and Rural Development Concentration): Thesis (Minimum 31 hours)

Participation in this two-year program includes U.S. students from the University of Arkansas and E.U. students from a consortium of five universities in Europe (University of Ghent, Ghent, Belgium; Humboldt University, Berlin, Germany; National Institute of Advanced Training and Research in Food and Agronomy, Rennes, France; University of Pisa, Pisa, Italy; and the Slovak University of Agriculture, Nitra, Slovakia). The program includes five academic terms (four semesters and one summer). U.S. students enroll for at least two terms at the University of Arkansas and for at least two terms at two E.U. universities in the European consortium. E.U. students enroll for at least two terms at two E.U. universities in the European consortium and at least two terms at the University of Arkansas. Study in both the U.S. and E.U. includes three semesters of graduate coursework, completion of a case study or internship during the summer, and one semester of joint thesis research supervised by U.S. and E.U. faculty. All coursework is in English in both the U.S. and E.U. Class enrollment for all students remains at their home university. University of Arkansas students earn credit for AGEC 502V Special Topics for courses taken at E.U. universities. Upon successful completion of the program, students receive an M.S. degree in agricultural economics from the University of Arkansas, and an M.S. degree in rural development from the consortium of E.U. universities.

Prerequisites to the Atlantis Concentration:

Six hours of mathematics (college algebra or above)	6
Three hours of statistics	3
Three hours of economic principles	3
Six hours of courses in agricultural economics, rural development, social sciences, or agriculture and agribusiness-related courses.	6
Total Hours	18

Core Requirements

Coursework from each of the following areas:

Quantitative Analysis or Research Methods	3
Management or Marketing	3
Policy or Analysis of Public Sector Issues	3
Six hours of master's thesis	6
AGEC 5011 Seminar	1

Controlled Electives 15

Other graduate courses in Agricultural Economics

Other graduate courses approved by the student's advisory committee

Other Requirements

Minimum of 16 hours in Agricultural Economics

Maximum of 15 hours of transfer courses from an inventory of classes offered in the Atlantis consortium of EU universities to satisfy core requirements and/or controlled electives.

M.S. in Agricultural Economics with International Agribusiness Concentration

Requirements for the Master of Science Degree in Agricultural Economics (International Agribusiness Concentration, Non-thesis):(Minimum 31 hours.)

Note: Participation in this program includes University of Ghent (Belgium), and University of Arkansas (UA) students. Students may study either semester at the UA campus and the other semester at the University of Ghent in Belgium, West Europe. Classes for UA students taken at the University of Ghent are in English. The summer may be spent completing

an agribusiness internship or special problem, but enrollment remains at the host institution. UA students earn credits in AGEC 502V Special Topics for courses taken at Ghent.

Prerequisites to the Non-thesis Concentration:

Six semester hours of mathematics (College Algebra and Survey of Calculus or Finite Mathematics or above)	6
Three semester hours of statistics	3
Six semester hours of lower division economic theory (micro & macro)	6
Three semester hours of upper-level management	3
Three semester hours of upper-level marketing	3
Three semester hours of introductory accounting.	3
Total Hours	24

Core Requirements

AGEC 5403	Quantitative Methods for Agribusiness	3
AGEC 5413	Agribusiness Strategy	3
AGEC 5143	Financial Management in Agriculture	3
	or AGEC 5043 Agricultural Finance	
	or AGEC 5213 Agricultural Business Management	
AGEC 5153	The Economics of Public Policy	3
	or AGEC 5233 Political Economy of Agriculture and Food	
	or AGEC 5133 Agricultural and Environmental Resource Economics	
	or AGEC 5603 Food Economics and Health	
AGEC 5303	Agricultural Marketing Theory	3
AGEC 5011	Seminar	1

Agribusiness Management (University of Ghent Electives)

Select the equivalent of 12 semester hours from the following:	12
AGEC 502V Special Topics	1-3
	Sociological Perspectives of Rural Development (3 credits)
AGEC 502V Special Topics	1-3
	Micro-economic Theory and Farm Management (3 credits)
AGEC 502V Special Topics	1-3
	Rural Project Management (3 credits)
AGEC 502V Special Topics	1-3
	Agricultural and Rural Policy (3 credits)
AGEC 502V Special Topics	1-3
	Rural Development and Agriculture (3 credits)
AGEC 502V Special Topics	1-3
	Development Economics (3 credits)
AGEC 502V Special Topics	1-3
	Agricultural Economics of Developing Countries (2 credits)
AGEC 502V Special Topics	1-3
	Advanced Marketing and Agribusiness Management (3 credits)
AGEC 502V Special Topics	1-3
	Applied Rural Economic Research Methods (3 credits)
AGEC 502V Special Topics	1-3
	Applied Statistics (3 credits)
AGEC 502V Special Topics	1-3
	Food Marketing and Consumer Behavior (3 credits)
AGEC 502V Special Topics	1-3
	Scientific Communications on Rural Development (2 credits)
AGEC 502V Special Topics	1-3

Econometrics (2 credits)

AGEC 502V Special Topics	1-3
	Economics and Management of Natural Resources (2 credits)
AGEC 502V Special Topics	1-3
	The European Union's International Development Policy (3 credits)

Controlled Electives 3

AGEC 503V Internship in Agricultural Economics

Other graduate courses in Agricultural Economics

Graduate courses in the Walton College of Business

Other graduate courses

Other Requirements

A maximum of 9 hours of AGEC graduate-level courses may be completed from a) those courses also offered as 4000-level undergraduate classes, and/or b) courses numbered 4000 or lower that do not have a corresponding graduate offering.

Minimum of 16 hours of Agricultural Economics

AGEC 502V Special Topics	1-3
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Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Graduate Faculty

Ahrendsen, Bruce L., Ph.D., M.S. (North Carolina State University), B.S. (Iowa State University), Professor, 1990.

Anderson, John D., Ph.D. (Oklahoma State University), M.S. (Arkansas State University), B.S. (College of the Ozarks), Professor, 2020.

Cochran, Mark J., Ph.D., M.S. (Michigan State University), B.S. (New Mexico State University), Professor, 1982.

Dixon, Bruce Lawrence, Ph.D., M.S. (University of California-Davis), B.A. (University of California-Santa Barbara), Professor, 1984.

Durand-Morat, Alvaro, Ph.D., M.S. (University of Arkansas), B.S.E. (National University of Entre Rios), Assistant Professor, 2016.

Fang, Di, Ph.D., W.P. (Arizona State University), B.A. (Nankai University), Assistant Professor, 2015.

Huang, Quiqiong, Ph.D. (University of California-Davis), B.S. (Remin University of China), Professor, 2013.

Kemper, Nathan, Ph.D., M.S. (University of Arkansas), B.S. (Missouri State University), Clinical Professor, 2014.

Kovacs, Kent F., Ph.D. (University of California-Davis), B.A. (Vassar College), Associate Professor, 2012.

Luckstead, Jeff A., Ph.D. (Washington State University), M.S., B.S. (University of Idaho), Associate Professor, 2013.

McKenzie, Andrew Malcolm, Ph.D. (North Carolina State University), M.Sc. (Stirling University), B.Admin. (University of Dundee), Professor, 1998.

Miller, Wayne P., Ph.D. (University of Wisconsin), M.S. (University of Illinois), B.S. (Purdue University), Extension Professor, 1992.

Nalley, Lawton Lanier, Ph.D. (Kansas State University), M.S. (Mississippi State University), B.S. (The Ohio State University), Professor, 2008.

Nayga, Rodolfo, Ph.D. (Texas A&M University), M.S. (University of Delaware), B.S. (Foreign Institution), Distinguished Professor, 2009.

Popp, Jennie Sheerin, Ph.D., M.S. (Colorado State University), B.S. (University of Scranton), Professor, 1998.

Popp, Michael P., Ph.D. (Colorado State University), M.B.A. (University of Colorado-Boulder), B.Comm. (University of Manitoba), Professor, 1998.

Rainey, Daniel V., Ph.D., M.S. (Purdue University), B.S.A. (University of Arkansas), Associate Professor, 2000.

Rainey, Ronald L., Ph.D., M.S., B.S.A. (University of Arkansas), Professor, 1993.

Rumley, Elizabeth Rebecca, LL.M. (University of Arkansas), J.D. (University of Toledo), B.A. (Michigan State University), Research Assistant Professor, 2008.

Rumley, Rusty W., J.D. (University of Oklahoma), Research Assistant Professor, 2009.

Thomsen, Michael R., Ph.D. (University of Minnesota-Morris), M.S., B.S. (Utah State University), Professor, 1998.

Watkins, Kenton Bradley, Ph.D. (Oklahoma State University), M.S., B.A. (University of Arkansas), Professor, 2002.

Courses

AGEC 500V. Special Problems. 1-3 Hour.

Individual reading and investigation of a special problem in agricultural economics not available under regular courses, under the supervision of the graduate faculty. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

AGEC 5011. Seminar. 1 Hour.

Presentation and discussion of graduate student research. Formal presentations are made by all graduate students. Consideration given to research design, procedures, and presentation of results. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

AGEC 502V. Special Topics. 1-3 Hour.

Advanced studies of selected topics in agricultural economics not available in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

AGEC 503V. Internship in Agricultural Economics. 1-3 Hour.

On-the-job application of skills developed in the M.S. program. (Typically offered: Fall, Spring and Summer)

AGEC 5043. Agricultural Finance. 3 Hours.

(Formerly AGEC 4143.) Methods and procedures whereby agricultural firms acquire and utilize funds required for their successful operation. Emphasis is placed upon role of finance and financial planning and consideration is given to an understanding of financial firms serving agriculture. Graduate degree credit will not be given for both AGEC 4143 and AGEC 5043. Prerequisite: (AGEC 1103 or ECON 2023) and (AGEC 2103 or ECON 2013) and (AGEC 2142 or ACCT 2013). (Typically offered: Fall)

AGEC 5053. Advanced Farm Business Management. 3 Hours.

(Formerly AGEC 4403.) Principles and procedures of decision making as applied to the allocation of resources in the farm business for profit maximization. Emphasis is placed on use of principles of economics and their application to the decision making process. Includes exercises on the application of principles to specific farm management problems. Graduate degree credit will not be given for both AGEC 4403 and AGEC 5053. Prerequisite: AGEC 3403 and ASTM 2903 or equivalent. (Typically offered: Fall)

AGEC 5063. Agricultural and Rural Development. 3 Hours.

(Formerly AGEC 4163.) Examination of agricultural and rural development issues in less developed countries. Alternative agricultural production systems are compared, development theories examined, and consideration given to the planning and implementation of development programs. Graduate degree credit will not be given for both AGEC 4163 and AGEC 5063. Prerequisite: AGEC 1103 (or ECON 2023). (Typically offered: Fall)

AGEC 5073. Basis Trading: Applied Price Risk Management. 3 Hours.

(Formerly AGEC 4373.) This course provides students an opportunity to gain a detailed working knowledge of how basis trading concepts and practices are applied to agricultural markets and to develop a skill set that can be put immediately into practice in any basis trading operation. Graduate degree credit will not be given for both AGEC 4373 and AGEC 5073. Prerequisite: AGEC 3373 or consent of instructor. (Typically offered: Spring and Summer)

AGEC 5083. Basis Trading: Case Study. 3 Hours.

(Formerly AGEC 4383.) This course provides an opportunity to apply principles learned in AGEC 4373 to grain merchandising using the case study approach. The course will involve in-class meetings supplemented with faculty-directed group-based learning experiences involving professional grain merchandisers. Group activities will follow the traditional case study method. Graduate degree credit will not be given for both AGEC 4383 and AGEC 5083. Prerequisite: AGEC 4373 or AGEC 5073 (formerly AGEC 4373). (Typically offered: Fall)

AGEC 5103. Agricultural Microeconomics. 3 Hours.

Masters-level training in agricultural microeconomic theory and its application to food, agriculture and the environment. The course covers behavior of firms, households and markets, in more depth and rigor than encountered in undergraduate courses. Theories are explained and then applied to relevant food, agricultural, environment and resource issues. (Typically offered: Fall)

AGEC 5113. Agricultural Prices and Forecasting. 3 Hours.

(Formerly AGEC 4113.) Price theory and techniques for predicting price behavior of general economy and price behavior of individual agricultural products will be analyzed. Provides practice in the application of economics and statistics to agricultural price analysis. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both AGEC 4113 and AGEC 5113. Prerequisite: (AGEC 1103 or ECON 2023), AGEC 2403, (STAT 2303 or WCOB 1033) and MATH 2053. (Typically offered: Spring)

AGEC 5123. AgriBusiness Entrepreneurship. 3 Hours.

(Formerly AGEC 4323.) Agribusiness entrepreneurship is the process of bringing food or rural-based products and services from conceptualization to market. The course presents the opportunities, problems and constraints facing individuals and firms operating in rural or isolated markets while emphasizing the steps in conceptualization, development, marketing, and delivery-selling of agribusiness rural products. Graduate degree credit will not be given for both AGEC 4323 and AGEC 5123. Prerequisite: AGEC 1103 or equivalent. (Typically offered: Spring)

AGEC 5133. Agricultural and Environmental Resource Economics. 3 Hours.

An economic approach to problems of evaluating private and social benefits and costs of altering the environment. Emphasis given to the interaction of individuals, institutions, and technology in problems of establishing and maintaining an acceptable level of environmental quality. Prerequisite: Minimum of 3 hours Agricultural Economics or Economics at 3000 level or higher or PhD standing. (Typically offered: Spring)

AGEC 5143. Financial Management in Agriculture. 3 Hours.

Covers advanced topics in agricultural finance. The general focus of the course is the financial management of non-corporate firms. Covers the basic tools of financial analysis including financial arithmetic, asset evaluation under risk, and financial analysis and planning using econometric models. Such topics covered include management of current assets, capital budgeting, capital structure, and institutions involved in agricultural finance. Prerequisite: Graduate standing. (Typically offered: Fall)

AGEC 5153. The Economics of Public Policy. 3 Hours.

This class will examine the impact of public policy on agricultural and other business sectors as well as households and individuals, particular in rural areas. Emphasis will also be placed on analyzing the potential impact of future policy changes. The course will focus on the application of welfare criteria and economic analyses to the problems and policies affecting resource adjustments in agriculture and rural communities. Prerequisite: Graduate standing. (Typically offered: Spring)

AGEC 5203. Agribusiness Marketing Management. 3 Hours.

(Formerly AGECE 4303.) Marketing concepts will be developed and applied to the global food and fiber system. The course will use both commodity and product marketing principles and economic theory to analyze varied marketing situations. Case studies will be used to demonstrate the role that demand analysis and consumer behavior play in market management. Graduate degree credit will not be given for both AGECE 4303 and AGECE 5203. Prerequisite: AGECE 2303 and AGECE 3303. (Typically offered: Spring)

AGEC 5213. Agricultural Business Management. 3 Hours.

(Formerly AGECE 4313.) The planning, organizing, leading and controlling functions of management as they relate to agricultural business firms. Marketing of value-added products, budgeting, organizational structure, cost control, financial statements, capital budgeting and employee supervision and motivation. Case studies are used to teach communication and decision-making skills. Graduate degree credit will not be given for both AGECE 4313 and AGECE 5213. Prerequisite: (AGECE 2142 and AGECE 2141L) or (ACCT 2013 and AGECE 2303 or equivalent). (Typically offered: Fall)

AGEC 5223. International Agricultural Trade and Commercial Policy. 3 Hours.

(Formerly AGECE 4623.) Analysis of agricultural market competition and performance in a global economy. The impact of domestic and international agricultural policies on domestic and international markets and welfare. Economic principles applied to the interaction of economic events in the world food economy. Graduate degree credit will not be given for both AGECE 4623 and AGECE 5223. Prerequisite: (AGECE 1103 or ECON 2023) and (AGECE 2103 or ECON 2013). (Typically offered: Spring)

AGEC 5233. Political Economy of Agriculture and Food. 3 Hours.

(Formerly AGECE 4613.) Agricultural and food policies are studied from domestic and international perspectives. Laws, regulations, decisions and actions by governments and other institutions are examined in terms of rationale, content, and consequences. Economic and political frameworks are used to assess policies in terms of competitive structure, operation, and performance of farming and food systems. Graduate degree credit will not be given for both AGECE 4613 and AGECE 5233. Prerequisite: (AGECE 1103 or ECON 2023) and (AGECE 2103 or ECON 2013) and (PSYC 2003 or SOCI 2013 or HDFS 2603). (Typically offered: Fall)

AGEC 5303. Agricultural Marketing Theory. 3 Hours.

Survey of the structure of agricultural product and factor markets including a critique of theoretical analyses of industry structure, conduct and performance; and a review of market structure research in agricultural industries. Prerequisite: Graduate standing. (Typically offered: Fall)

AGEC 5403. Quantitative Methods for Agribusiness. 3 Hours.

Application of quantitative techniques used to support managerial decision-making and resource allocation in agricultural firms. Provides exposure to mathematical and statistical tools (regression analysis, mathematical programming, simulation) used in economic analysis in agriculture. Emphasis is placed on computer applications with conceptual linkage to economic theory. Prerequisite: Graduate standing. (Typically offered: Fall)

AGEC 5413. Agribusiness Strategy. 3 Hours.

Addresses problems of strategy formulation in agribusiness emphasizing current problems and cases in agriculture. Surveys modern and classic perspectives on strategy with applications to agribusiness. Examines the development of firm level strategies within the structure and competitive environment of agricultural firms and industries. Prerequisite: Graduate standing. (Typically offered: Spring)

AGEC 5603. Food Economics and Health. 3 Hours.

This course provides an advanced overview of selected topics in food economics, food and nutrition policy and the interface between nutrition programs and health policy. Students will develop an understanding of economic and policy concepts of food, nutrition, and health. The course emphasizes analytical tools that can be applied to study issues in food, nutrition, and health facing the US and world populations. Prerequisite: Graduate standing. (Typically offered: Spring)

AGEC 5613. Econometrics. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. The single equation model is examined emphasizing multicollinearity, autocorrelation, heteroskedasticity, binary variables and distributed lags and model specification. Prerequisite: MATH 2043 and knowledge of matrix methods, (which may be acquired as a corequisite), and (AGECE 1103 or ECON 2023) and (AGECE 2403 or STAT 2303 or WCOB 1033). (Typically offered: Spring)

AGEC 5623. Quantitative Food and Agricultural Policy Analysis. 3 Hours.

Introduction to applied analysis of domestic and international food and agricultural policies using quantitative tools. This course will provide hands-on experience with simulation modeling in microeconomics. An emphasis is placed on policy analysis through computer applications with theoretical underpinnings. Corequisite: Lab component. Prerequisite: (AGECE 5103 and AGECE 5403) or instructor consent. (Typically offered: Spring)

AGEC 5713. Food Safety Law. 3 Hours.

This course provides students with an introduction to food law and policy, history of food regulation, the organization of federal food law and regulatory agencies, government inspection and enforcement powers, food safety standards, food labeling, food advertising and product liability. Web-based course. (Typically offered: Irregular)

AGEC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

AGEC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Agricultural and Extension Education (AEED)

George Wardlow
Department Head
E108 Agricultural, Food, and Life Sciences Building
479-575-2035
Email: wardlow@uark.edu

Donna L. Graham
Graduate Coordinator
E108 Agricultural, Food, and Life Sciences Building
479-575-2035
Email: dgraham@uark.edu

Agricultural and Extension Education website (<http://agricultural-education-communications-and-technology.uark.edu/graduate-studies/>)

Degrees Conferred:

M.S. (AEED)

Areas of Study: Agricultural education, communication, technology, or extension education, and a technical area.

Primary Areas of Faculty Research: Agricultural teacher education; extension and non-formal education; agricultural systems technology management; and agricultural communications.

M.S. in Agricultural and Extension Education

Prerequisites to Degree Program: Bachelor's degree in a closely allied field. Some deficiency courses may be assessed depending on the background and educational objectives of the student. Applicants must be admitted to the Graduate School and must have a) satisfactory undergraduate preparation in related fields of study and b) satisfactory GRE or MAT scores. In addition, applicants must submit three letters of recommendation and a writing sample.

Requirements for the Master of Science (M.S.) Degree: This program requires 33 semester hours, with a choice of either a thesis or non-thesis option.

Thesis Option: There are 12 hours of core courses consisting of AGED 5463 Research Methodology in the Social Sciences, AGED 5473 Interpreting Social Data in Agriculture, AGED 5053 Philosophy of Agricultural and Extension Education, and AGED 5001 Seminar (3, 1-hour sections). Additionally, students in the thesis option complete a written thesis, AGED 600V (6 hours). The thesis will focus on a research problem related to agricultural education, communications, leadership, technology or extension education.

Non-Thesis Option: There are 12 hours of core courses consisting of AGED 5463 (<http://catalog.uark.edu/search/?P=AGED%205463>) Research Methodology in the Social Sciences (Fa), AGED 5473 (<http://catalog.uark.edu/search/?P=AGED%205473>) Interpreting Social Data in Agriculture (Fa), and AGED 5053 (<http://catalog.uark.edu/search/?P=AGED%205053>) Philosophy of Agricultural and Extension Education (Sp) and a 3-hour communication elective.

The remaining hours (15 for the thesis option, 21 for the non-thesis option) may be taken in a technical area or in agricultural and extension education courses. Students should work with their advisory committee to choose courses to meet their academic goals.

A comprehensive examination is required of all candidates, including an oral examination for the thesis candidate, and a written examination for the non-thesis candidate.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Graduate Faculty

Cox, Casandra Kay, M.S., B.S. (University of Arkansas), Instructor, Department of Agricultural Education, Communications and Technology, 2003.

Graham, Donna Lucas, Ph.D. (University of Maryland-College Park), M.Ed., B.S. (University of Arkansas), University Professor, Department of Agricultural Education, Communications and Technology, 1985.

Johnson, Donald M., Ph.D. (University of Missouri-Columbia), M.A., B.S. (Western Kentucky University), Professor, Department of Agricultural Education, Communications and Technology, 1993.

Miller, Jefferson Davis, Ph.D., M.A. (Oklahoma State University), B.A. (Northeastern State University), Professor, Department of Agricultural Education, Communications and Technology, 2001.

Rucker, Kathryn Jill, Ph.D., M.B.A., B.S. (Oklahoma State University), Associate Professor, Department of Agricultural Education, Communications and Technology, 2013.

Shoulders, Kate, Ph.D. (University of Florida), M.S., M.A. (Murray State University), Associate Professor, Department of Agricultural Education, Communications and Technology, 2012.

Wardlow, George W., Ph.D. (The Ohio State University), M.Ed., B.S. (University of Missouri-Columbia), Professor, Department of Agricultural Education, Communications and Technology, 1992.

Courses

AGED 5001. Seminar. 1 Hour.

Presentations and discussion of graduate student research as well as review of current literature and topics of current interest by students and faculty. All graduate students will make at least one formal presentation. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

AGED 5013. Advanced Methods in Agricultural Mechanics. 3 Hours.

Emphasis on shop organization and management, courses of study, unit shop instruction, and development of skills in agricultural mechanics. (Typically offered: Summer Odd Years)

AGED 5053. Philosophy of Agricultural and Extension Education. 3 Hours.

An examination and analysis of social and economic events leading to the establishment and maintenance of federal, state, county, and local agricultural education programs. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Spring)

AGED 510V. Special Problems. 1-6 Hour.

Individual investigation of a special problem in agricultural education which is not available through regular courses. These will be directed by a member of the graduate faculty. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

AGED 5113. Undergraduate Researchers Improving Student Experiences. 3 Hours.

To engage students in the social sciences in action research that serves to solve a problem or answer a question within the student's academic field through scientific inquiry. All students will work with professionals, commonly outside of the university, within their discipline to conduct their action research in order to solve a problem experienced by that professional. Students may work in teams or individually to complete the overall purpose of the course. Prerequisite: AGED 5463 or HESC 5463 or other instructor approved Research Methods course. (Typically offered: Spring)

AGED 520V. Special Topics in Agricultural and Extension Education. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in agriculture education. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

AGED 5443. Principles of Technological Change. 3 Hours.

(Formerly AGED 4443.) This course introduces a structured approach for dealing with the organizational and human aspects of technology transition, including the key concepts of resistance and change management, organizational change, communications, and processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. This course may be offered as a web-based course. Graduate degree credit will not be given for both AGED 4443 and AGED 5443. (Typically offered: Fall Odd Years)

AGED 5463. Research Methodology in the Social Sciences. 3 Hours.

Logical structure and the method of science. Basic elements of research design; observation, measurement, analytic method, interpretation, verification, presentation of results. Applications to research in economic or sociological problems of agriculture and human environmental sciences. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with HESC 5463.

AGED 5473. Interpreting Social Data in Agriculture. 3 Hours.

The development of competencies in analyzing, interpreting and reporting the results of analyses of social science data in agriculturally related professions. Students will select appropriate analysis techniques and procedures for various problems, analyze data, and interpret and report the results of statistical analyses in narrative and tabular form. (Typically offered: Fall)

AGED 5483. Technical Communication in the Social Sciences. 3 Hours.

This course will provide students with the basic principles and techniques in communicating social science information relevant to human subject research in agriculture, natural resources, and life sciences to the general public. Communication processes covered in the course include audience identification, writing, editing, and production of social science-based materials for popular and refereed publications. Focus will also be placed on thesis preparation and writing and research manuscript development and dissemination of social science research. Web delivered course. Prerequisite: Graduate standing. (Typically offered: Spring)

AGED 5493. Survey Design and Scale Development. 3 Hours.

This course is designed to provide the expertise required to design and conduct survey research. Students will understand the instruments (scales/questionnaire) used in data collection processes and acquire the statistical skills necessary to develop and test these survey instruments. This course uses both theory and practice. Hands-on training will be provided via SPSS package for data analyses, and Qualtrics will be used for web-based surveys. Prerequisite: 3 hours of graduate level statistics coursework and HESC 5463 or AGED 5463 or instructor consent. (Typically offered: Summer)

This course is cross-listed with HESC 5053.

AGED 5563. Thesis Proposal Development. 3 Hours.

The purpose of this course is to assist graduate students in the preparation of their thesis research proposal. Students will produce the first three chapters of their thesis by the end of the course. Prerequisite: AGED 5463 or HESC 5463. (Typically offered: Fall)

AGED 5632. Teaching Diverse Populations in Agricultural and Extension Education. 2 Hours.

(Formerly AGED 4632.) This course is designed to provide pre-service teachers of agriculture with an understanding of teaching diverse populations as applied to problems of practice in agricultural and extension education. Graduate degree credit will not be given for both AGED 4632 and AGED 5632. (Typically offered: Spring)

AGED 575V. Internship in Agricultural Education. 1-6 Hour.

Scheduled practical field experiences under supervision of a professional practitioner in off-campus secondary school systems. Emphasis includes classroom preparation, teaching, and student evaluation. (Typically offered: Fall, Spring and Summer)

AGED 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with FDSC 5993, HORT 5993.

AGED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Agricultural, Food and Life Sciences (AFLS)

Lona J. Robertson
Associate Dean, Dale Bumpers College of Agricultural, Food and Life Sciences
AFLS E115

479-575-4445

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Vicky Watkins

Program Coordinator

AFLS E206

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Degree Conferred:

M.S. in Food Safety (FDSF)

Ph.D. in Agricultural, Food and Life Sciences (AFLS) with Agricultural Education, Communication and Technology Concentration (p. 17)

Ph.D. in Agricultural, Food and Life Sciences (AFLS) with Entomology Concentration (p.)

Ph.D. in Agricultural, Food and Life Sciences (AFLS) with Horticulture Concentration (p. 173)

Ph.D. in Agricultural, Food and Life Sciences (AFLS) with Plant Pathology Concentration (p. 266)

Program Description: The interdisciplinary Ph.D. program, which encompasses four concentrations, allows faculty from across the Dale Bumpers College of Agricultural, Food, and Life Sciences to prepare students in a wide array of natural and social sciences within the agricultural, food and life sciences. The four concentrations allow students to specialize within a specific discipline, while developing a tailored degree program with electives and committee members from other disciplines.

The Master of Science in Food Safety is designed to prepare students for higher positions in the food industry. The program provides a subject matter core of courses in food microbiology, sanitation, food processing, epidemiology, food law, HACCP applications, human diseases, and other quality control areas facing the food industry.

The M.S. in Food Safety (<https://online.uark.edu/programs/master-science-food-safety.php>) is offered online through the University of Arkansas Global Campus.

Requirements for M.S. in Food Safety

The Master of Science in Food Safety program requires a total of 30 hours of graduate-level work. Each student will complete one three-hour special problem in which a technical paper will be developed. This requirement may be satisfied by an approved thesis project in the Poultry or Food Science department. No more than a total of 6 hours of thesis, special problems and internships are recognized for degree requirements with no more than a total of 6 hours of special problems and internships. Each special problem course should be limited to three hours of credit. An oral examination over all course work and the special problem project or thesis is required.

The student's advisory committee will outline the total program of study and will also determine if any course deficiencies should be addressed. An applicant must meet all of the requirements for admission to the Graduate School. The program's steering committee provides guidelines for student admission and establishes degree requirements. The student and the Program Coordinator, with approval of the Dean of the Graduate School, select a major adviser. The major adviser, in consultation with the student, will recommend additional faculty members to serve on the student's advisory committee, including one member from the program steering committee.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Courses

AFLS 501V. Special Topics. 1-3 Hour.

Studies of selected topics not covered in other courses. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Animal Science (ANSC)

Michael Looper
Department Head
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479-575-4351
Email: looper@uark.edu

Elizabeth Kegley
Graduate Admissions Chair
B114 AFLS
479-575-4351
Email: ekegley@uark.edu

Department of Animal Science Website (<http://animal-science.uark.edu>)

Degrees Conferred:

M.S., Ph.D. (ANSC)

Areas of Study: Graduate studies in subject matter areas of genetics, nutrition, parasitology, meats and physiology may be pursued. Beef cattle, dairy cattle, swine, sheep, and laboratory animals are available for research programs in the Animal Science Department.

Primary Areas of Faculty Research: Animal nutrition; animal physiology; animal breeding (genetics); meat science (muscle biology); parasitology.

M.S. in Animal Science

Prerequisites to Degree Programs: The student pursuing a program for a Master of Science degree must meet all general requirements of the Graduate School. In addition, the student must have completed the B.S. degree, preferably in a college or university with a major or equivalent in one of the areas of the Animal Science Department. Applicants must submit three letters of recommendation. All applicants must submit scores on the Graduate Record Examinations.

For acceptance into a course of study leading to the Ph.D. degree, a grade-point average of 3.00 on all previous graduate work and three letters of recommendation are required. All applicants must submit scores on the Graduate Record Examinations. Students accepted into the Ph.D. program without a M.S. must have a 3.20 cumulative grade-point average on all undergraduate work. The student will have a minimum of 24 hours post-baccalaureate work and 18 hours of dissertation at the end of the program.

Requirements for the Master of Science Degree: (Minimum 30 hours.)

Thesis Option. The thesis option requires a minimum of 24 hours of graduate course work, plus six hours of thesis research credit. The student and adviser will prepare a program of work that may include additional undergraduate basic courses and at least 24 semester hours of studies plus the successful completion and defense of a thesis and submission of one research paper suitable for submission to a peer reviewed professional journal. The defense of the thesis will consist of an oral defense administered by the graduate adviser and the thesis committee. Any deficiencies in undergraduate major requirements or

prerequisites for advanced courses may be included in the student's program in addition to the 24 hours.

Non-thesis Option. The non-thesis option requires the completion of the plan of study outlined below, and successful performance on a final exam, but does not require the preparation of a thesis.

Requirements for application and admission to the non-thesis option:

- Applicants must meet the admission requirements of the University of Arkansas Graduate School. All applicants must submit scores on the GRE.
- An undergraduate B.S. degree in Animal Science or a closely related field of study, OR
- B.S. degree in another field with strong emphasis in the area of biological sciences (deficiency courses in addition to the prescribed 30 hour plan of study may be required).
- B.S. applicants without a strong background in biological sciences may be considered for admission to the program, but will be required to complete deficiency courses, as determined by the graduate admissions committee, in addition to the prescribed 30 hour plan of study.

Students must be accepted by a graduate adviser to begin the non-thesis program. The graduate adviser and the student's graduate committee will administer the non-thesis program. Degree requirements will be completed when the student has satisfactorily completed course work that meets the requirement for the non-thesis degree as listed below, and has satisfactorily completed a final exam. Students must have a final GPA # 2.85 to graduate from the program.

Non-Thesis M.S. Program Requirement: 30 hours minimum

Core Courses: 18-19 hours

Basic Program Core: 4 Hours

ANSC 5901	Seminar	1
AGST 5023	Principles of Experimentation	3
STAT 5003 & STAT 5001L	Statistical Methods and Statistics Methods Laboratory	4
ESRM 5393	Statistics in Education and Health Professions	3
ESRM 6403	Educational Statistics and Data Processing	3

OR, any graduate level statistics course approved by the advisory committee.

Animal Science Core Courses: 8-9 Hours

Genetics: 3 hours

ANSC 5123 Advanced Animal Genetics

Nutrition: 3 hours

Any 5000 level or higher nutrition class in ANSC

Physiology: 2-3 Hours

ANSC 5923 Brain & Behavior

ANSC 5932 Cardiovascular Physiology of Domestic Animals

ANSC 5942 Endocrine Physiology of Domestic Animals

ANSC 5952 Respiratory Physiology of Domestic Animals

ANSC 5962 Gastrointestinal/Digestive Physiology of Domestic Animals

ANSC 5972	Renal Physiology	
ANSC 6833	Reproduction in Domestic Animals	

ANSC Electives: 9 Hours

Any graduate-level course in ANSC

General Electives: 9 Hours

CHEM 3813	Elements of Biochemistry	3
(Note: Graduate School approval is required.)		
GRSD 5003	The Professoriate: Teaching, Learning and Assessment	3

Any 5000 or 6000 level course in departments within AFLS or in BIOL, CHEM, ESRM, or STAT

Or any graduate-level course approved by the graduate advisory committee.

Other program requirements

No more than two credit hours of seminar can be included in the 30 credit hour total.

At least 15 credits of ANSC courses must be at the 5000 level or above.

Non-thesis programs may include no more than three (3) hours of special problems in the minimum 30-credit hour requirement.

No more than six (6) hours of 4000-level graduate courses may be counted toward the 30-credit hour requirement.

Students are expected to meet with the graduate mentor at least once per semester.

Students are required to complete the annual graduate student progress report.

Transition Between M.S. Programs: A student can transition from the non-thesis to a thesis program with the approval of the graduate adviser and the department head. A student desiring to transition from the thesis to the non-thesis program must have the approval of the graduate adviser, the M.S. thesis committee, the department head, and the graduate dean. In addition, no credit will be granted for thesis hours, and a maximum of six hours of course work completed at the time of transition can be counted in the non-thesis degree program. Students in the non-thesis option are not eligible for departmental assistantships.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Animal Science

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the requirements will consist of a program of research, appropriate course work and seminars as specified by the student's graduate committee, as well as a dissertation and two research papers acceptable to the dissertation committee.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Coffey, Ken, Ph.D. (University of Missouri-Columbia), M.S. (University of Kentucky), B.S. (University of Tennessee), Professor, 1996.

Gadberry, M. Shane, Ph.D., M.S., B.S. (University of Arkansas), Professor, 2006.

Huang, Yan, Ph.D. (University of Wyoming), M.S. (Dankook University), B.S. (China Agricultural University), Assistant Professor, 2015.

Jennings, John A., Ph.D. (University of Missouri), M.S. (University of Arkansas), B.S. (Southwest Missouri State University), Professor, 1998.

Jogan, Kathleen, Ed.D., M.S. (University of Arkansas), B.S. (Ursinus College), Instructor, 2015.

Kegley, Beth, Ph.D., M.S. (North Carolina State University), B.S. (Virginia Polytech Institute and State University), Professor, 1996.

Kimbrough, Chelsey, Ph.D. (Texas Tech), M.S. (University of Georgia), B.S.A. (University of Arkansas), Associate Professor, 2015.

Kutz, Bryan Richard, M.S. (Western Kentucky University), B.S. (Oklahoma State University), A.S. (Northern Oklahoma College), Instructor, 1997.

Littlejohn, Brittni P., Ph.D. (Texas A&M University), Assistant Professor, 2019.

Looney, Charles R., Ph.D. (Louisiana State University), Professor, 2019.

Looper, Michael L., Ph.D. (Oklahoma State University), M.S., B.S. (University of Arkansas), Professor, 2011.

Maxwell, Charles, Ph.D. (University of Wisconsin-Madison), M.S., B.S. (University of Georgia), Professor, 1996.

Philipp, Dirk, Ph.D. (Texas Tech University), M.S., B.S. (University of Leizig, Germany), Associate Professor, 2007.

Pohliman, Fred W., Ph.D. (Kansas State University), M.S. (University of Tennessee), B.S. (University of Missouri-Columbia), Professor, 1997.

Powell, Jeremy G., Ph.D. (University of Arkansas), D.V.M. (Oklahoma State University), B.S. (University of Arkansas), Professor, 2009.

Rorie, Rick, Ph.D. (Louisiana State University), M.S., B.S. (University of Arkansas), Professor, 1989.

Russell, Mark, Ed.D. (Texas Tech University), M.S., B.S. (Colorado State University), Assistant Professor, 2010.

Shore, Jordan T., M.S. (Missouri State University), Instructor, 2019.

Thomas, Lauren, D.V.M. (Oklahoma State University), B.S. (University of Arkansas), Teaching Assistant Professor, 2016.

Ward, Heidi, Ph.D. (University of Oklahoma), D.V.M. (Oklahoma State University), B.S. (University of Oklahoma), Assistant Professor, 2015.

Yazwinski, Tom, Ph.D. (North Carolina State University), M.S. (University of Maine), B.S. (University of Vermont), University Professor, 1977.

Zhao, Jiangchao, Ph.D. (University of Wisconsin-Madison), M.S., B.S. (China Agricultural University), Associate Professor, 2015.

Courses

ANSC 500V. Special Problems. 1-6 Hour.

Work in special problems of animal industry. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANSC 5013. Domestic Animal Energetics. 3 Hours.

Physical, physiological and biochemical aspects of energy metabolism of domestic animals and their applications to livestock production. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

ANSC 5023. Legal Issues in Animal Agriculture. 3 Hours.

(Formerly ANSC 4123.) An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues. The wide range of regulation- from local to state to federal, depending on the issue- will be studied and discussed. Graduate degree credit will not be given for both ANSC 4123 and ANSC 5023. (Typically offered: Spring Odd Years)

ANSC 5052. Cow-Calf Management. 2 Hours.

(Formerly ANSC 4252.) Systems of cow-calf management including the practical application of the principles of breeding, feeding, and management to commercial and purebred beef cattle under Arkansas conditions. Graduate degree credit will not be given for both ANSC 4252 and ANSC 5052. (Typically offered: Fall)

ANSC 510V. Special Topics in Animal Sciences. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in animal sciences. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

ANSC 5123. Advanced Animal Genetics. 3 Hours.

Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: ANSC 3123. (Typically offered: Fall Even Years)

This course is cross-listed with POSC 5123.

ANSC 5143. Biochemical Nutrition. 3 Hours.

Interrelationship of nutrition and physiological chemistry; structure and metabolism of physiological significant carbohydrates, lipids, and proteins; integration of metabolism with provision of tissue fuels; specie differences in regulatory control of tissue and whole body metabolism of nutrients. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

This course is cross-listed with POSC 5143.

ANSC 5152. Protein and Amino Acid Nutrition. 2 Hours.

Students will be introduced to the basic processes of protein digestion, amino acid absorption, transport, metabolism, and utilization along with how biochemical function of proteins and their dynamic state affect nutritional status for animals and man. Prerequisite: CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with POSC 5152.

ANSC 5163. Companion Animal Nutrition. 3 Hours.

This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring)

This course is cross-listed with POSC 5163.

ANSC 5253. Advanced Livestock Production. 3 Hours.

Comprehensive review of recent advances in research relative to the various phases of livestock production. (Typically offered: Irregular)

ANSC 5262. Swine Production. 2 Hours.

(Formerly ANSC 4262.) Methods in producing purebred and commercial swine with specific emphasis on the management programs needed for profitable pork production in Arkansas. Graduate degree credit will not be given for both ANSC 4262 and ANSC 5262. (Typically offered: Fall Even Years)

ANSC 5272. Sheep Production. 2 Hours.

(Formerly ANSC 4272.) Purebred and commercial sheep management emphasizing the programs of major importance in lamb and wool production in Arkansas. Graduate degree credit will not be given for both ANSC 4272 and ANSC 5272. (Typically offered: Spring Odd Years)

ANSC 5283. Horse Production. 3 Hours.

(Formerly ANSC 4282.) Production, use and care of horses and ponies including breeding, feeding, handling, and management. Lecture 2 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both ANSC 4282 and ANSC 5283. Corequisite: Lab component. (Typically offered: Spring)

ANSC 5452. Milk Production. 2 Hours.

(Formerly ANSC 4452.) Principles of breeding, feeding, and management of dairy cattle will be studied. Graduate degree credit will not be given for both ANSC 4452 and ANSC 5452. (Typically offered: Spring)

ANSC 5482. Companion Animal Management. 2 Hours.

(Formerly ANSC 4482.) The study and application of principles of domestication, nutrition, reproduction, parasitology, diseases, behavior, and husbandry management to companion animals. Dogs, cats, and exotic animals will be the species of primary interest. Practical problems of care and management of these species will be solved. Graduate degree credit will not be given for both ANSC 4482 and ANSC 5482. Prerequisite: BIOL 1543 or equivalent or consent of instructor. (Typically offered: Fall)

ANSC 5553. Forage-Ruminant Relations. 3 Hours.

Advanced chemical, physical, and botanical characteristics of forage plants, the dynamics of grazing, intake and digestion, and techniques of measuring forage utilization and systems analysis at the plant-animal interface. Lecture 3 hours per week. CSES 1203 recommended. Corequisite: Lab component. Prerequisite: ANSC 3143. (Typically offered: Spring Odd Years)

This course is cross-listed with CSES 5553.

ANSC 5652. Stocker-Feedlot Cattle Management. 2 Hours.

(Formerly ANSC 4652.) Production and management systems for stocker and feed-lot cattle including practical applications of forage systems, feeding, health management and economics of production of these livestock. Graduate degree credit will not be given for both ANSC 4652 and ANSC 5652. (Typically offered: Spring)

ANSC 5662. Comparative Studies in Panamanian and US Agricultural Practices. 2 Hours.

An experiential-learning course with an embedded trip to Panama designed to give students an overview of the agricultural industry and the impact of Panamanian history, culture and geography on agriculture and how this contrasts with practices in the US. Students will participate in a study tour to Panama where they will engage in learning experiences that explore the agriculture, history, and culture of this country. They will have the opportunity to visit and learn from successful producers of livestock and agricultural staples as well as tour the Panama canal and learn about Panamanian culture and history. Prerequisite: Instructor consent and approval from Study Abroad office. (Typically offered: Spring)

ANSC 5743L. Advanced Analytical Methods in Animal Sciences Laboratory. 3 Hours.

Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. (Typically offered: Fall)

This course is cross-listed with POSC 5743L.

ANSC 5853. Advanced Meats Technology. 3 Hours.

An intensive study of processed meats, relating the science, technology, and quality of further processed meat and poultry products. Product development, sensory and chemical analysis, microbiology, nutritional aspects, and product labeling are covered. Prerequisite: POSC 4314 or ANSC 3613. (Typically offered: Spring Even Years)

ANSC 5901. Seminar. 1 Hour.

Critical review of the current scientific literature pertaining to the field of animal science. Oral reports. Lecture 1 hour per week. Prerequisite: Senior standing. (Typically offered: Fall)

ANSC 5923. Brain & Behavior. 3 Hours.

Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory systems and the autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with POSC 5923.

ANSC 5932. Cardiovascular Physiology of Domestic Animals. 2 Hours.

Cardiovascular physiology, including mechanisms of heart function and excitation, and blood vessel mechanisms associated with the circulatory system in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)
This course is cross-listed with POSC 5932.

ANSC 5942. Endocrine Physiology of Domestic Animals. 2 Hours.

Endocrine physiology, including mechanisms of hormone secretion, function, and regulation. Mechanisms associated with the endocrine system will be discussed for domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (or first 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)
This course is cross-listed with POSC 5942.

ANSC 5952. Respiratory Physiology of Domestic Animals. 2 Hours.

Respiratory physiology, including mechanisms of lung function and gas exchange. Mechanisms associated with the interaction of the respiratory system with other bodily systems in domestic animals and poultry will be discussed. Lecture 3 hours; drill 1 hour per week for first 8 weeks of semester. Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Spring)
This course is cross-listed with POSC 5952.

ANSC 5962. Gastrointestinal/Digestive Physiology of Domestic Animals. 2 Hours.

Gastrointestinal and hepatic physiology, including mechanisms of digestion, absorption of nutrients with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)
This course is cross-listed with POSC 5962.

ANSC 5972. Renal Physiology. 2 Hours.

Renal physiology, including mechanisms of renal clearance with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Spring)
This course is cross-listed with POSC 5972.

ANSC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ANSC 6123. Advanced Food Animal Wellbeing. 3 Hours.

Advances in fundamentals of animal welfare including animal health, animal handling, food safety and productivity. Prerequisite: Instructor consent. (Typically offered: Spring)
This course is cross-listed with POSC 6123.

ANSC 6143. Minerals in Animal Nutrition. 3 Hours.

Mineral nutrients, their sources and functions, as related to nutrition of domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Fall; Spring Even Years)

ANSC 6243. Ruminant Nutrition. 3 Hours.

Anatomy and physiology of the rumen. The nutrient requirements of microbial organisms and the relation of microbial digestion in the rumen to the nutrition of cattle, sheep and other ruminants. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

ANSC 6343. Vitamin Nutrition in Domestic Animals. 3 Hours.

The vitamins required by domestic animals with emphasis upon their role in animal nutrition, physiological functions, and consequences of failure to meet the requirement of the animal. Lecture 3 hours per week. Prerequisite: ANSC 3143 (or POSC 4343) and CHEM 3813. (Typically offered: Spring Even Years)
This course is cross-listed with POSC 6343.

ANSC 6833. Reproduction in Domestic Animals. 3 Hours.

Comprehensive review of current theory of reproductive function in domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3433. (Typically offered: Spring Even Years)

ANSC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Anthropology (ANTH)

JoAnn D'Alisera
Department Chair
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Director of Graduate Studies
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479-575-2508
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Anthropology Department Website (<http://anth.uark.edu>)

Degrees Conferred:

M.A., Ph.D. (ANTH)

Areas of Study: Archeology; biological/physical anthropology, and cultural anthropology.

Primary Areas of Faculty Research: The biological anthropology faculty studies the present and past nature and evolution of humans and other primates. Faculty specializations are evolutionary theory, paleoanthropology, dental analysis, bioarcheology, comparative morphometrics. The cultural anthropology program focuses on such issues as gender, class, religion, and public culture as shaped by history and migration. Faculty area specialties include North America, Latin America, the Middle East, and Africa. Training is offered in popular memory, material culture, religion, performance studies, sociolinguistics, ethnobiology, medical anthropology, and popular culture. The archeology faculty is particularly strong in the U.S. Southeast, Great Plains, and the Middle East. Their research interests range from ethnohistory to lithic analysis, Quaternary environments, ground-based geophysical and satellite remote sensing, applications of geographical information systems technology, quantitative techniques, mortuary studies, historical archeology, and ecology. A major emphasis, in collaboration with the Arkansas Archeological Survey, is public archeology.

M.A. in Anthropology

Prerequisites to Degree Program: Applicants must be admitted to the Graduate School and meet the following requirements: 1) satisfactory undergraduate preparation in anthropology, 2) three letters from persons competent to judge applicant's potential for graduate studies, 3) satisfactory GRE scores, and 4) a completed departmental application. Students who do not meet these requirements may be

admitted conditionally. Students with course deficiencies may enroll concurrently in graduate courses.

Requirements for the Master of Arts Degree: (Minimum 30/36 hours, depending on option chosen.) A student may choose one of three options to satisfy the requirements for a Master of Arts degree in anthropology:

Anthropology M.A. with Thesis:(Minimum 30 hours.) A minimum of 24 semester hours of course work including distribution requirements specified by the department, six semester hours of thesis, and an oral examination conducted by the candidate's faculty committee.

Anthropology M.A. with Internship: A minimum of 30 semester hours of course work including distribution requirements specified by the department, six hours of internship, evidence of research ability, and an oral exam conducted by the candidate's faculty committee.

Anthropology M.A. without Thesis: Thirty-six semester hours including distribution requirements specified by the department and an oral examination conducted by the candidate's faculty committee.

A list of courses that meet the general distribution requirement is available from the departmental chair. A minimum of 21 graduate hours in anthropology is required in all three options.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Anthropology

Requirements for the Doctor of Philosophy Degree:(Minimum of 42 hours, including 18 hours of dissertation.)

Admission Requirements: Applicants are generally required to have a master's degree in anthropology (or the equivalent) and demonstrate competence in the subfields of archeology, biological anthropology, and cultural anthropology. A student who begins doctoral study with an M.A. from another university must take the courses required for the M.A. here that were not taken elsewhere, but these deficiency courses may, with the consent of the student's advisory committee, count toward the 24-hour course requirement. Applicants without a master's degree in anthropology (or its equivalent) but with exceptionally strong qualifications may be admitted directly into the Ph.D. program at the discretion of the department faculty.

Advisory Committee: During the first semester of study, all students will be assigned an advisory committee that will determine their particular programs. Students will select a subfield of specialization (archeology, biological anthropology, or cultural anthropology).

Foreign Language Requirement:Students are required to demonstrate competence in a foreign language.

Course Requirements: Students in the doctoral program are required to complete 24 semester hours of course work for graduate credit beyond the M.A. degree. This work will include four seminar courses to include at least one class in archeology, biological anthropology, and cultural anthropology. To strengthen and support an area of expertise, a student may take up to six hours of graduate course work in other departments. Subject to the approval of the student's adviser, these hours will count toward the 24-hour course requirement for the degree.

Candidacy Examinations:A student must complete Graduate School residence requirements and departmental course requirements before taking the written candidacy examinations. Students will notify their committees of their intention to take the examination, and their advisory

committee will construct the examination questions. The exams will be taken on campus over a period of three days. The areas that will be examined are discussed in the department's Graduate Student Handbook.

The student's advisory committee, in consultation with other faculty as needed, will evaluate the written answers. The student's advisory committee chair will meet with the student and provide relevant feedback, including any weaknesses in the written examination that might need to be addressed in the oral examination.

The committee chair will then schedule an oral exam with the student's advisory committee. After the oral exam, the advisory committee will meet and make one of the following recommendations:

1. The student has demonstrated the knowledge, skills, and abilities to proceed with his/her dissertation. The student is then admitted to candidacy.
2. Remedial work is necessary. Remedial work may include taking portions of the qualifying exam again, writing another paper, taking an additional course or independent study, or other options as appropriate. Upon successful completion of this remedial work, the student will be admitted to candidacy.
3. The student is not admitted to candidacy.

The committee recommendations will be communicated in writing to the student and to the department chair, and the Graduate School will be notified in writing by the department chair when students have passed their candidacy examinations.

Proposal Defense:Upon admission to candidacy, students will select a dissertation committee with a major professor as chair to direct the research and writing. Under direction of the major professor, candidates will develop programs of reading in the general areas and research techniques pertinent to preparing their dissertations. To demonstrate competence in this preparation, the dissertation committee will conduct an oral proposal defense. This proposal defense must be taken no later than the end of the fall or spring semester after completing the written qualifying examinations.

Dissertation and Dissertation Defense: Students will demonstrate a capacity for independent research by writing an original dissertation on a topic within their subfield of specialization. Within the time limits specified by the Graduate School, students must submit a dissertation acceptable to their dissertation committee. Students' final examinations will be oral and primarily a defense of their dissertations.

Teaching Requirement: Although the Doctor of Philosophy degree is primarily a research degree, communication skills are critical to professional development. Therefore, each doctoral candidate will be required to engage in teaching activities before completion of the program.

Faculty members located off-campus are available for research and individual guidance in any of these options. They may also chair and serve on student committees.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Environmental Dynamics: Anthropology participates in the interdisciplinary Ph.D. program in Environmental Dynamics (p. 138).

Common Market: Through an agreement with the Academic Common Market (p. 489), residents of certain Southern states may qualify for

graduate enrollment in this degree program as in-state students for fee purposes.

Graduate Faculty

Beaupre, Andrew, Ph.D. (William and Mary), Research Assistant Professor, 2019.

D'Alisera, JoAnn, Ph.D., A.M. (University of Illinois-Urbana-Champaign), B.A. (State University of New York at New Paltz), Associate Professor, 1999.

Delezene, Lucas, Ph.D., M.A. (Arizona State University), B.S. (Emory University), Instructor, 2011.

Erickson, Kirstin C., Ph.D., M.A. (University of Wisconsin-Madison), B.A. (St. Olaf College), Associate Professor, 2001.

Horton, Elizabeth T., Ph.D. (Washington University, St. Louis), Research Assistant Professor, 2019.

Kathryn, Koziol, Ph.D. (University of Arkansas), Teaching Assistant Professor, 2019.

Kay, Marvin, Ph.D. (University of Colorado-Boulder), M.A., B.A. (University of Missouri-Columbia), Professor, 1980.

Kowalski, Jessica Anne, Ph.D. (University of Alabama), Research Assistant Professor, 2019.

Kvamme, Kenneth L., Ph.D. (University of California-Santa Barbara), M.A., B.A. (Colorado State University), Professor, 1999.

Marion, Jonathan S., Ph.D., M.A. (University of California-San Diego), B.A. (University of Redlands), Associate Professor, 2012.

Natarajan, Venkatesan Ram, Ph.D., M.A. (New York University), B.A. (Johns Hopkins University), Assistant Professor, 2015.

Nolan, Justin Murphy, Ph.D., M.A. (University of Missouri-Columbia), B.A. (Westminster College), Associate Professor, 2002.

Paul, Kathleen, Ph.D., M.A. (Arizona State University), B.A. (New York University), Assistant Professor, 2019.

Plavcan, Joseph M., Ph.D., B.A. (Duke University), Professor, 2001.

Rose, Jerry, Ph.D., M.A. (University of Massachusetts), B.A. (University of Colorado), University Professor, 1976.

Sabo, George, Ph.D., M.A., B.S. (Michigan State University), Professor, 1980.

Stoner, Wesley, Ph.D., M.A. (University of Kentucky), B.A. (Pennsylvania State University), Assistant Professor, 2014.

Swedenburg, Ted R., Ph.D., M.A., (University of Texas at Austin), B.A. (University of Beirut), Professor, 1996.

Terhune, Claire E., Ph.D., M.A. (Arizona State University), B.A., B.S. (College of Charleston), Assistant Professor, 2013.

Ungar, Peter S., Ph.D., M.A. (State University of New York at Stony Brook), B.A. (State University of New York, Binghamton), Distinguished Professor, 1995.

Villaseñor, Amelia, Ph.D. (George Washington University), B.A. (Arizona State University), Assistant Professor, .

Vining, Benjamin R., Ph.D., M.A. (Boston University), B.A. Colgate University, Assistant Professor, 2016.

Courses

ANTH 500V. Advanced Problems in Anthropology. 1-18 Hour.
Individual research at graduate level on clearly defined problems or problem areas. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

ANTH 5053. Quaternary Environments. 3 Hours.
An interdisciplinary study of the Quaternary Period including dating methods, deposits, soils, climates, tectonics, and human adaptation. Lecture 2 hours, laboratory 2 hours per week. (Typically offered: Fall)
This course is cross-listed with ENDY 5053, GEOS 5053.

ANTH 5063. Popular Culture. 3 Hours.
(Formerly ANTH 4033.) Study of national and international varieties of popular culture, including music, dance, fashion, and the media. Emphasis will be given to both ethnographic approaches, which focus on the investigation of production and consumption of cultural forms and to cultural studies approaches, which see culture as a terrain of struggle. Graduate degree credit will not be given for both ANTH 4033 and ANTH 5063. (Typically offered: Irregular)

ANTH 5093. The Archeology of Death. 3 Hours.
(Formerly ANTH 4093.) Study of the analysis and interpretation of archeological mortuary remains and sites. Key archeological and anthropological sources that have influenced major theoretical developments are reviewed. Graduate degree credit will not be given for both ANTH 4093 and ANTH 5093. (Typically offered: Irregular)

ANTH 5103. Applications of Cultural Method and Theory. 3 Hours.
Review of the nature and history of cultural anthropology; recent theories and practical implications and applications of various methods of acquiring, analyzing and interpreting cultural anthropological data. (Typically offered: Fall)

ANTH 5113. Anthropology of the City. 3 Hours.
Examines cities as both products of culture, and sites where culture is made and received. Explores the implications of several pivotal urban and cultural trends and the way in which representations of the city have informed dominant ideas about city space, function, and feel. (Typically offered: Irregular)

ANTH 5133. Settlement Archaeology. 3 Hours.
(Formerly ANTH 4133.) Focuses on the historical development of settlement archeology, the methods of site survey and discovery within regions, ecological and social theories that underlie patterns of human land use and distribution, methods of site location analysis, and descriptive and predictive site location modeling. Graduate degree credit will not be given for both ANTH 4133 and ANTH 5133. (Typically offered: Irregular)

ANTH 5143. Ecological Anthropology. 3 Hours.
(Formerly ANTH 4143.) Anthropological perspectives on the study of relationships among human populations and their ecosystems. Graduate degree credit will not be given for both ANTH 4143 and ANTH 5143. (Typically offered: Irregular)

ANTH 5153. Topics in Anthropology. 3 Hours.
Graduate level seminar with varied emphasis on topics relating to cultural anthropology. (Typically offered: Irregular) May be repeated for degree credit.

ANTH 5203. Applications of Archeological Method and Theory. 3 Hours.
Review of the nature and history of archeology; recent theories and practical implications and applications of various methods of acquiring, analyzing, and interpreting archeological data. (Typically offered: Fall)

ANTH 5243. Archeology of the Midsouth. 3 Hours.
(Formerly ANTH 4243.) Survey of prehistoric and protohistoric cultures of the lower Mississippi Valley and adjacent regions. Graduate degree credit will not be given for both ANTH 4243 and ANTH 5243. (Typically offered: Irregular)

ANTH 5256. Archeological Field Session. 6 Hours.
(Formerly ANTH 4256.) Practical field and laboratory experiences in archeological research. Graduate degree credit will not be given for both ANTH 4256 and ANTH 5256. (Typically offered: Summer)

ANTH 5263. Indians of Arkansas and the South. 3 Hours.
Study of the traditional lifeways and prehistoric backgrounds of Indians living in the southern United States, including Arkansas. (Typically offered: Spring Odd Years)

ANTH 5273. Photography for Fieldwork. 3 Hours.
(Formerly ANTH 4273.) This class explores the use of photographic images as both data and representational tools in anthropological research, emphasizing the ethical, theoretical, and methodological issues involved. Graduate degree credit will not be given for both ANTH 4273 and ANTH 5273. (Typically offered: Irregular)

ANTH 5283. Survey in Ethnographic Film. 3 Hours.

(Formerly ANTH 4283.) Survey of the development and evolution of ethnographic film, based on class screenings to build familiarity, vocabulary, and literacy with this branch of visual anthropology. Graduate degree credit will not be given for both ANTH 4283 and ANTH 5283. (Typically offered: Irregular)

ANTH 5293. Identity and Culture in the U.S.-Mexico Borderlands. 3 Hours.

(Formerly ANTH 4263.) An exploration of the interplay between Latino/a, Mexican, Anglo, and Native American identities and cultures along the U.S.-Mexico border. Course examines identity formation, hybridity, social tension, marginalization, race and gender, from an anthropological perspective, paying special attention to the border as theoretical construct as well as material reality. Graduate degree credit will not be given for both ANTH 4263 and ANTH 5293. (Typically offered: Irregular)

ANTH 5303. Applications of Method and Theory in Biological Anthropology. 3 Hours.

Review of the nature and history of biological anthropology; recent theories and the practical implications and applications of various methods of acquiring, analyzing, and interpreting data. (Typically offered: Irregular)

ANTH 5313. Laboratory Methods in Archeology. 3 Hours.

(Formerly ANTH 4353.) Theory and practice of describing, analyzing, and reporting upon archeological materials. Graduate degree credit will not be given for both ANTH 4353 and ANTH 5313. (Typically offered: Irregular)

ANTH 5363. Museums, Material Culture, and Popular Imagination. 3 Hours.

(Formerly ANTH 4363.) Museums as ideological sites and thus as sites of potential contestation produce cultural and moral systems that legitimate existing social orders. This course will focus on strategies of representation and the continuous process of negotiating social and cultural hierarchies with and through objects that are displayed. Graduate degree credit will not be given for both ANTH 4363 and ANTH 5363. (Typically offered: Fall)

ANTH 5413. Bioarcheology Seminar. 3 Hours.

Intensive coverage of bioarcheological method and theory with the context of both academic and cultural resources management research. (Typically offered: Spring Odd Years)

ANTH 5443. Cultural Resource Management I. 3 Hours.

Concentrated discussion of management problems relative to cultural resources, including review and interpretation of relevant federal legislation, research vs. planning needs, public involvement and sponsor planning, and assessment of resources relative to scientific needs. No field training involved; discussion will deal only with administrative, legal, and scientific management problems. (Typically offered: Irregular)

ANTH 5473. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall) This course is cross-listed with WLLC 5463, ENGL 5463.

ANTH 548V. Individual Study of Anthropology. 1-6 Hour.

(Formerly ANTH 448V.) Reading course for advanced students with special interests in anthropology. Graduate degree credit will not be given for both ANTH 448V and ANTH 548V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANTH 5513. African Religions: Gods, Witches, Ancestors. 3 Hours.

(Formerly ANTH 4513.) An exploration of African religions from a variety of anthropological perspectives, exploring how religious experience is perceived and interpreted by adherents, highlighting the way in which individual and group identities are constructed, maintained and contested within religious contexts. Readings reflect the vast diversity of religious life in Africa. Graduate degree credit will not be given for both ANTH 4513 and ANTH 5513. (Typically offered: Irregular)

ANTH 5523. Dental Science. 3 Hours.

(Formerly ANTH 4523.) Introduction to the study of the human dentition including its anatomy, morphology, growth and development, and histology. Graduate degree credit will not be given for both ANTH 4523 and ANTH 5523. (Typically offered: Fall)

ANTH 5553. Introduction to Raster GIS. 3 Hours.

(Formerly ANTH 4553.) Theory, data structures, algorithms, and techniques behind raster-based geographical information systems. Through laboratory exercises and lectures multidisciplinary applications are examined in database creation, remotely sensed data handling, elevation models, and resource models using boolean, map algebra, and other methods. Credit will not be given for both ANTH 4553 and ANTH 5553. (Typically offered: Fall)

This course is cross-listed with GEOS 5453.

ANTH 5563. Vector GIS. 3 Hours.

(Formerly ANTH 4563.) Introduction to geographic information systems (GIS) applications in marketing, transportation, real estate, demographics, urban and regional planning, and related areas. Lectures focus on development of principles, paralleled by workstation-based laboratory exercises using mainstream GIS software and relational databases. Credit will not be given for both ANTH 4563 and ANTH 5563. (Typically offered: Spring)

This course is cross-listed with GEOS 5583.

ANTH 5583. Cultures of Africa. 3 Hours.

An exploration of the people and places of Africa from a variety of anthropological perspectives. Classic and contemporary works will be studied in order to underscore the unity and diversity of African cultures, as well as the importance African societies have played in helping us understand culture/society throughout the world. (Typically offered: Fall)

ANTH 5593. Introduction to Global Positioning Systems and Global Navigation Satellite Systems. 3 Hours.

(Formerly ANTH 4593.) Introduction to navigation, georeferencing, and digital data collection using GPS and GNSS receivers, data loggers, and laser technology. Components of NavStar GLONASS, Beidou and other global positioning system are used in integration of digital information into various GIS platforms with emphasis on practical applications. Credit will not be given for both ANTH 4593 and ANTH 5593. (Typically offered: Spring)

This course is cross-listed with GEOS 5293.

ANTH 5603. Landscape Archaeology. 3 Hours.

(Formerly ANTH 4603.) This course provides an introduction to the methods and theories of landscape archaeology. Topics include archaeological survey techniques, environmental and social processes recorded in the archaeological landscape, and analysis of ancient settlement and land use data to reveal changes in population, resource utilization, and environmental relationships. Credit will not be given for both ANTH 4603 and ANTH 5603. (Typically offered: Fall)

ANTH 561V. Field Research in Archeology. 1-6 Hour.

Directed graduate level archeological fieldwork. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ANTH 5623. Primate Adaptation and Evolution. 3 Hours.

(Formerly ANTH 4613.) Introduction to the biology of the order of Primates. This course considers the comparative anatomy, behavioral ecology and paleontology of our nearest living relatives. Credit will not be given for both ANTH 4613 and ANTH 5623. (Typically offered: Spring)

This course is cross-listed with BIOL 5613.

ANTH 5633. Archeological Prospecting & Remote Sensing. 3 Hours.

(Formerly ANTH 4633.) Ground-based geophysical, aerial, and other remote sensing methods are examined for detecting, mapping, and understanding archeological and other deposits. These methods include magnetometry, resistivity, conductivity, radar, aerial photography, thermography, and multispectral scanning. Requires computer skills, field trips, and use of instruments. Credit will not be given for both ANTH 4633 and ANTH 5633. (Typically offered: Irregular)

ANTH 5653. GIS Analysis and Modeling. 3 Hours.

(Formerly ANTH 4653.) Unlike conventional GIS courses that focus on studying 'where', this course will teach students to address beyond 'where' using various GIS analysis and modeling techniques to explore 'why' and 'how'. The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. Credit will not be given for both ANTH 4653 and ANTH 5653. (Typically offered: Spring)

This course is cross-listed with GEOS 5653, ENDY 5043.

ANTH 5703. Mammalian Evolution and Osteology. 3 Hours.

(Formerly ANTH 4703.) This course will focus on describing the evolutionary history of mammals, a group of vertebrates that include over 5,000 species in 29 orders, and will provide an overview of living species and their identifying features. Credit will not be given for both ANTH 4703 and ANTH 5703. Prerequisite: ANTH 1013 and ANTH 1011L, BIOL 1543 and BIOL 1541L, or instructor consent. (Typically offered: Irregular)

This course is cross-listed with BIOL 5883.

ANTH 5803. Historical Archeology. 3 Hours.

(Formerly ANTH 4803.) Review of the development of historical archeology and discussion of contemporary theory, methods, and substantive issues. Lab sessions on historic artifact identification and analysis. Graduate degree credit will not be given for both ANTH 4803 and ANTH 5803. (Typically offered: Irregular)

ANTH 5813. Ethnographic Approaches to the Past. 3 Hours.

(Formerly ANTH 4813.) Review of the uses of ethnographic data in the reconstruction and interpretation of past cultures and cultural processes, with particular emphasis on the relationships between modern theories of culture and archeological interpretation. Credit will not be given for both ANTH 4813 and ANTH 5813. (Typically offered: Irregular)

ANTH 582V. Applied Visual Research. 1-6 Hour.

(Formerly ANTH 482V.) This class provides hands-on skill and training conducting visually informed fieldwork designed to help represent unique cultural settings, experience, and heritage. Credit will not be given for both ANTH 482V and ANTH 582V. (Typically offered: Irregular)

ANTH 5863. Quantitative Anthropology. 3 Hours.

(Formerly ANTH 4863.) Introductory statistics course for anthropology students examines probability theory, nature of anthropological data, data graphics, descriptive statistics, probability distributions, test for means and variances, categorical and rank methods, ANOVA, correlation and regression. Lectures focus on theory methods; utilize anthropological data and a statistical software laboratory. Credit will not be given for both ANTH 4863 and ANTH 5863. (Typically offered: Irregular)

This course is cross-listed with GEOS 5863.

ANTH 5903. Seminar in Anthropology. 3 Hours.

(Formerly ANTH 4903.) Research, discussion, and projects focusing on a variety of topics. Credit will not be given for both ANTH 4903 and ANTH 5903. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ANTH 5913. Topics of the Middle East. 3 Hours.

(Formerly ANTH 4913.) Covers a special topic or issue. Credit will not be given for both ANTH 4913 and ANTH 5913. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ANTH 6033. Society and Environment. 3 Hours.

This course examines the complex interrelationships between human societies and the natural environment. Drawing on diverse and interdisciplinary perspectives in archaeology, ethnography, history, geography, and palaeo-environmental studies, readings and discussion will explore the co-production of social and environmental systems over time. (Typically offered: Spring) May be repeated for degree credit. This course is cross-listed with ENDY 6033.

ANTH 610V. Internship. 1-18 Hour.

Internship. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

ANTH 6813. Seminar: Cultural Anthropology. 3 Hours.

Variable topics in Anthropology will be explored in depth. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 6823. Seminar: Archeology. 3 Hours.

Various topics in Archeology will be explored in depth. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 6833. Seminar: Biological Anthropology. 3 Hours.

Various topics in Biological Anthropology will be explored in depth. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall and Spring) May be repeated for degree credit.

Art (ARTS)

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Degree Conferred:

M.F.A. (ART)

Program Description: The objective of the program of study leading to the degree of Master of Fine Arts in art shall be professional achievement of high order, a knowledge of art history and criticism, the development of a fundamental grasp and understanding of the professional field of art and its relationship to supporting fields of knowledge, as well as the satisfactory completion of course work and other degree requirements. The program of study will vary depending upon the art medium areas selected for the creative work and the goals of the individual graduate student. The Master of Fine Arts degree in art is considered to be the terminal degree in studio art and is awarded in recognition of professional development in the visual arts as evidenced by a period of successful post-bachelor's degree study. The M.F.A. degree is recognized as preparatory to studio art teaching positions at institutions of higher education.

Areas of Study: Major areas of study include drawing, painting, sculpture, design, printmaking, ceramics, and photography.

M.F.A. in Art

Prerequisites to Degree Programs: An earned bachelor's degree with an art major concentration or its equivalent. Consideration will be given

to applicants without an art major concentration who present evidence of proficiency in creative work in the visual arts.

Acceptance to the M.F.A. degree program requires a two-semester art history survey or its equivalent. Failing to meet this requirement, the M.F.A. student is required to complete the appropriate semesters of survey of art history for non-graduate credit.

In addition to the requirements for admission to the Graduate School, the applicant must also submit the following materials to the School of Art: transcripts of college level work; at least three letters of reference concerning art work, work habits, and potential for graduate study in art; a portfolio of art works; a personal statement concerning background, conceptual and technical development, and goals for graduate study in visual art; and an application form obtained from the School of Art on request.

Requirements for the Master of Fine Arts Degree: Completion of a minimum of 60 semester credit hours and a minimum of six regular semesters in residence (not to include summer terms).

1. A minimum of 42 credit hours in studio courses:
 - a. A minimum focused study area of a total of 24 credit hours. For each semester in residence, excluding summers and the final semester, M.F.A. candidates must enroll in a minimum of three hours in their focused study area as advised by their media area adviser.
 - b. One semester of ARTS 5923 MFA First Year Seminar, to be taken in the fall semester of the first year of study, and one semester of ARTS 5933 MFA Second Year Seminar, to be taken in the fall semester of the second year of study (total of 6 credit hours).
 - c. A minimum of 12 Studio Art Elective credit hours. These may include 3 credit hours in excess of the required 12 hours of Art History and/or criticism. Up to 6 credit hours in graduate courses taken outside the School of Art may be included, with prior approval. Students electing to take only 9 hours of Art History will complete 15 hours of electives.
2. Art History requirement: While in the M.F.A. program, the student is required to complete a minimum of 12 hours of art history. Students admitted to the program with 12 or more hours of prior college level art history courses may elect to take only 9 hours of Art History. Requirements include:
 - a. Six hours of elected art history courses. (Three hours for students with 12 or more hours of prior college level art history)
 - b. ARHS 5933 Contemporary Art
 - c. ARHS 5763 Seminar in Critical Theory
3. In the final year prior to graduation, the M.F.A. candidate must demonstrate satisfactory progress toward the M.F.A. exhibition thesis by meeting regularly with the thesis chair and committee, as well as faculty and peers in the M.F.A. candidate's media area.
4. The required final semester in the M.F.A. program is to be devoted to work on the M.F.A. exhibition, ARTS 601V (<http://catalog.uark.edu/search/?P=ARTS%20601V>) (6 credit hours), the production and presentation, under the direction of a graduate committee, of a one-person exhibition of art work. The M.F.A. candidate will be responsible for making one acceptable digital presentation of the exhibition and exhibition statements, which will be retained by the School of Art and the University Library.

The final semester must be completed during a regular school year. During this final semester, the M.F.A. candidate may enroll for three additional credit hours in electives if the candidate does not hold a

graduate assistantship. The M.F.A. candidate holding an assistantship may not take additional credits in the final semester.

In addition to the requirements listed above, the M.F.A. program in Art also requires:

1. **Graduate Critiques:** All M.F.A. students are required to participate in regular reviews critiquing their artworks. These reviews involve both a mid-term critique conducted by several faculty members and a final critique attended by a selected group of School of Art Graduate faculty and M.F.A. students. After M.F.A. students receive Candidacy, their participation is still required although they will no longer need to present their artwork for review.
2. **Candidacy Application and Review:** After completion of four semesters in the M.F.A. degree program, the student will make application to be a candidate for completion of the M.F.A. degree. A committee of graduate faculty members will conduct a formal review of the applicant's work and progress in the program. The awarding of candidacy will be dependent upon a three-fourths majority vote by the student's graduate faculty committee based on the following criteria: 1) a demonstrated formal and technical proficiency in the applicant's major studio area; 2) conceptual development as demonstrated by growth in ideas supporting the applicant's creative research; 3) an ability to locate their research in the context of issues and practices within contemporary and historical art issues; and 4) the ability to communicate the intention and basis of their research in coherent written and verbal form. At least two regular semesters of residence must be completed after acceptance as a degree candidate. Students who do not pass the Candidacy Review will be allowed one additional Candidacy Review, held during the following regular semester. Students failing to pass Candidacy the second time will be dismissed from the program.
3. **Graduate Committee and Major Adviser:** When the student has been accepted as a degree candidate, the student will select a major adviser from the graduate art faculty. The major adviser will serve as adviser to the student in planning the completion of the program of study. At least one semester before graduation, a four- or five-member committee of graduate art faculty will be selected. The student's major adviser will be chairperson of this committee, and one member of the graduate committee will represent the art history area. The degree candidate may select one additional committee member from a discipline outside the School of Art.

Graduate Faculty Art History Courses

ARHS 5013. Case Studies in Art History. 3 Hours.

This class provides in-depth studies of selected artists, themes, or specific groups of art works. This course is only offered during intersession. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 5563. Pre-Columbian Art. 3 Hours.

An introduction to pre-Columbian art from Mexico (3000 BC- 1521 AD) through a survey of works of art from different media: sculpture, architecture, and mural painting. Topics examined include: sacred images, political uses of sculpture, architecture and cosmogony, as well as the relationship between the material and content. (Typically offered: Irregular)

ARHS 5573. Artists of New Spain. 3 Hours.

An overview of colonial art in colonial New Spain. Focused on native agency, social function of art, and cross-cultural communication. Topics include indigenous materials and techniques, the use of images in legal contexts, and ritual liturgy. Some consideration will be given to artworks from the viceroyalty of Peru. (Typically offered: Irregular)

ARHS 5763. Seminar in Critical Theory. 3 Hours.

(Formerly ARHS 4763.) Study of critical theory as it relates to problems in modern and contemporary art. Graduate degree credit will not be given for both ARHS 4763 and ARHS 5763. (Typically offered: Spring)

ARHS 5773. History of New Media Art. 3 Hours.

(Formerly ARHS 4773.) Examines the history of 'new media' art in relation to larger shifts in technology, philosophy and politics. Beginning in the 19th century, the course explores the development of photography, film, video, performance, sound and digital art through the 20th century. Culminates with an examination of contemporary practice. Graduate degree credit will not be given for both ARHS 4773 and ARHS 5773. (Typically offered: Irregular)

ARHS 5793. Making the Museum: History, Theory and Practice. 3 Hours.

Presents a broad overview of the institutional history and the contemporary professional practice of the museum world. Features numerous visiting lectures from a working professionals from the local area and nationwide institutions. (Typically offered: Spring Even Years)

ARHS 5813. The History of Photography. 3 Hours.

(Formerly ARHS 4813.) Survey of photography from 1685 to present. Graduate degree credit will not be given for both ARHS 4813 and ARHS 5813. (Typically offered: Irregular)

ARHS 5823. History of Graphic Design. 3 Hours.

(Formerly ARHS 4823.) Survey of graphic design history from 1850 to the present. Graduate degree credit will not be given for both ARHS 4823 and ARHS 5823. Prerequisite: ARHS 2923. (Typically offered: Irregular)

ARHS 5833. Ancient Art. 3 Hours.

(Formerly ARHS 4833.) Study of selections from the visual arts of Mesopotamia, Egypt, Greece, or Rome. Graduate degree credit will not be given for both ARHS 4833 and ARHS 5833. (Typically offered: Irregular)

ARHS 5843. Medieval Art. 3 Hours.

(Formerly ARHS 4843.) Study of Early Christian, Byzantine, Early Medieval, Romanesque, and Gothic styles. Graduate degree credit will not be given for both ARHS 4843 and ARHS 5843. (Typically offered: Irregular)

ARHS 5853. Italian Renaissance Art. 3 Hours.

(Formerly ARHS 4853.) Study of Proto-Renaissance, Early, High Renaissance, and Mannerist styles in Italy. Graduate degree credit will not be given for both ARHS 4853 and ARHS 5853. (Typically offered: Irregular)

ARHS 5863. Northern Renaissance Art. 3 Hours.

(Formerly ARHS 4863.) Study of Late Gothic and Renaissance styles in the Netherlands, Germany, and France. Graduate degree credit will not be given for both ARHS 4863 and ARHS 5863. (Typically offered: Irregular)

ARHS 5873. Baroque Art. 3 Hours.

(Formerly ARHS 4873.) Study of art styles of the 17th century, primarily in Italy, Spain, France, Flanders, and the Netherlands. Graduate degree credit will not be given for both ARHS 4873 and ARHS 5873. (Typically offered: Irregular)

ARHS 5883. 18th and 19th Century European Art. 3 Hours.

(Formerly ARHS 4883.) Study of eighteenth- and nineteenth-century art and architecture in Europe. Graduate degree credit will not be given for both ARHS 4883 and ARHS 5883. (Typically offered: Irregular)

ARHS 5893. 20th Century European Art. 3 Hours.

(Formerly ARHS 4893.) Study of the major styles and movements of the century, including Cubism, Fauvism, German Expressionism, and Surrealism. Graduate degree credit will not be given for both ARHS 4893 and ARHS 5893. (Typically offered: Irregular)

ARHS 5913. American Art to 1860. 3 Hours.

(Formerly ARHS 4913.) The visual arts in the United States from Colonial times through 1860. Graduate degree credit will not be given for both ARHS 4913 and ARHS 5913. (Typically offered: Irregular)

ARHS 5923. American Art 1860-1960. 3 Hours.

(Formerly ARHS 4923.) The visual arts in the United States from the onset of the American Civil War through the Cold War Era. Graduate degree credit will not be given for both ARHS 4923 and ARHS 5923. (Typically offered: Irregular)

ARHS 5933. Contemporary Art. 3 Hours.

(Formerly ARHS 4933.) Study of styles and major trends in the visual arts since 1960. Graduate degree credit will not be given for both ARHS 4933 and ARHS 5933. (Typically offered: Fall)

ARHS 5953. Art Museum Studies. 3 Hours.

(Formerly ARHS 4953.) A survey of the history and function of the art museum and an introduction to museum work. Investigation of collections and collections management, conservation, exhibitions, education and public programs, museum management, and contemporary issues which effect the museum profession. Graduate degree credit will not be given for both ARHS 4953 and ARHS 5953. Prerequisite: ARHS 2913 and ARHS 2923, or graduate Art MFA standing. (Typically offered: Irregular)

ARHS 5973. Seminar in Art History. 3 Hours.

(Formerly ARHS 4973.) Special studies of periods and styles of art. Graduate degree credit will not be given for both ARHS 4973 and ARHS 5973. Prerequisite: 9 hours of Art History. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ARHS 5983. Special Topics in Art History. 3 Hours.

(Formerly ARHS 4983.) Subject matter not covered in regularly offered courses, and relating to the history of art before the nineteenth century. May be repeated for different topics. Graduate degree credit will not be given for both ARHS 4983 and ARHS 5983. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 5993. Special Topics in Modern Art. 3 Hours.

(Formerly ARHS 4993.) Subject matter not covered in regularly offered courses, and relating to the history of art from the nineteenth century to the present. May be repeated for different topics. Graduate degree credit will not be given for both ARHS 4993 and ARHS 5993. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 6413. Greek Art and Archaeology. 3 Hours.

Greek Art and Archaeology focuses on how visual and material culture shaped and were shaped by Greek society (religion, politics, military, economy, gender, etc.) from the Bronze Age through the Hellenistic period. Masterpieces of Greek art are analyzed alongside the material remains of everyday Greeks in civic and domestic spaces. (Typically offered: Spring Odd Years)

ARHS 6423. Roman Art and Archaeology. 3 Hours.

Roman Art and Archaeology focuses on how visual and material culture shaped and were shaped by Roman society (religion, politics, economy, gender, ethnicity, etc.) from the Iron Age through the Late Antique period. We encounter famous masterpieces, but also the material remains of everyday Romans in civic and domestic spaces. (Typically offered: Spring Even Years)

ARHS 6613. African Art and Society. 3 Hours.

Situates the artistic production of modern Africa (1800-present) within a socio-cultural framework, taking into consideration the role of the artist, the methods of production, the relationship between form and function, and the impact of geopolitical shifts (including intercontinental trade, colonialization, and globalization) on the artistic practice. (Typically offered: Irregular)

ARHS 6623. African American Art History. 3 Hours.

Surveys African American art from the seventeenth century to the present. It begins with a discussion of the transatlantic slave trade and it examines art produced in what Pratt terms the 'contact zones'. It then follows developments in African American art from the Antebellum Period to the present. (Typically offered: Irregular)

ARHS 6633. Contemporary African Art. 3 Hours.

Serves as a forum for the study of contemporary African art. It situates African art from the 1980s to the present within a historic context, addressing the impact of geopolitical ruptures on artistic practices, and it examines how the work operates across different intellectual, political, and geographical spheres. (Typically offered: Irregular)

ARHS 6783. Special Topics in Contemporary Art. 3 Hours.

Examines specialized topics within the field of contemporary art, with special attention to cutting-edge issues confronting artists today. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 6933. Graduate Research In Art History. 3 Hours.

Independent study in specific areas of art history and criticism. (Typically offered: Irregular)

Art Courses

ARTS 5023. Figure Drawing II. 3 Hours.

(Formerly ARTS 4023.) Advanced study of the figure with emphasis on figure structure and its relationship to pictorial form in drawing. Graduate degree credit will not be given for both ARTS 4023 and ARTS 5023. (Typically offered: Irregular)

ARTS 5513. Technical Ceramics. 3 Hours.

(Formerly ARTS 4513.) Advanced study of ceramic materials and processes. Clay composition, clay body formulation and analysis, glaze composition and formulation, firing methods (low, mid, and high-temperature gas, electric and atmospheric firings), and kiln design will be covered in depth. Graduate degree credit will not be given for both ARTS 4513 and ARTS 5513. Prerequisite: ARTS 4503. (Typically offered: Irregular)

ARTS 5723. Experiments in Moving Image I. 3 Hours.

An introduction to experimental video art, providing a theoretical and practical foundation for creating video for installation, performance or screen, set within a context of historical and contemporary video art and experimental film. Students will complete assignments creating new, original moving image works. (Typically offered: Fall and Spring)

ARTS 5783. Critical Issues in Experimental Media Art. 3 Hours.

Explores a variety of contemporary critical issues and methodologies in Experimental Media Art, while building a deeper theoretical and practical understanding of creating for the twenty-first century. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARTS 5813. Digital Photography. 3 Hours.

(Formerly ARTS 4813.) Introduction to digital photography production, techniques and theory. Digital input from scanning (flatbed & slide/negative), digital cameras, video and internet sources. Computer assisted manipulation of imagery for correction and abstraction. Output to a digital printing systems, analog systems (film recorder), servers and Internet. Graduate degree credit will not be given for both ARTS 4813 and ARTS 5813. Prerequisite: ARTS 3803. (Typically offered: Fall and Spring)

ARTS 5833. Advanced Black and White Photography. 3 Hours.

(Formerly ARTS 4833.) Advanced black and white theory, practice and techniques including: Zone System, large format camera and studio lighting. Graduate degree credit will not be given for both ARTS 4833 and ARTS 5833. Prerequisite: ARTS 3803. (Typically offered: Irregular)

ARTS 584V. Special Problems in Photography. 1-6 Hour.

(Formerly ARTS 484V.) Individual instruction for advanced undergraduates and graduate students. Special projects in photography designated by students in collaboration with faculty. Graduate degree credit will not be given for both ARTS 484V and ARTS 584V. Prerequisite: ARTS 3803 and (ARTS 3813 or ARTS 4823 or ARTS 4833). (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ARTS 5883. Bookmaking. 3 Hours.

(Formerly ARTS 5883.) Introduction to the creation of unique, limited edition artist's bookworks -- with emphasis on technical knowledge and conceptual understanding of the book form as a means of artistic expression. Graduate degree credit will not be given for both ARTS 4883 and ARTS 5883. (Typically offered: Irregular) This course is equivalent to ARTS 4883.

ARTS 5913. Graduate Seminar in Studio Art. 3 Hours.

Special seminars at the graduate level in Studio Art. Subject matter changes depending on student interest and faculty expertise. Prerequisite: Admission to MFA program. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARTS 5923. MFA First Year Seminar. 3 Hours.

Introduction to graduate level study in art, including pedagogy related to teaching art at the college level. Topics to be covered include: development of research interests, critical thinking within studio practice, situating work in the contemporary context, expectations at the graduate level, and an introduction to techniques and theories of studio art education. Prerequisite: Admission to MFA program. (Typically offered: Fall)

ARTS 5933. MFA Second Year Seminar. 3 Hours.

Preparation for a professional art practice. Examination of theoretical and practical aspects of career development for contemporary artists. Prerequisite: ARTS 5923. (Typically offered: Fall)

ARTS 596V. Fine Arts Gallery Internship. 1-3 Hour.

(Formerly ARTS 493V.) Study all aspects of operating the Fine Arts Gallery. Research and preparation for exhibitions, organize and install exhibits, care of art works, create and distribute publicity, arrange interviews with newspapers, and other media. Graduate degree credit will not be given for both ARTS 493V and ARTS 596V. (Typically offered: Fall, Spring and Summer)

ARTS 601V. Master of Fine Arts Exhibition. 1-6 Hour.

Production and presentation of a one person exhibition of art work. The M.F.A. candidate will be responsible for making three acceptable slide sets of the exhibition and exhibition statements. Prerequisite: M.F.A. candidacy. (Typically offered: Fall, Spring and Summer)

ARTS 602V. Graduate Drawing. 1-6 Hour.

Individual problems in drawing techniques. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

ARTS 6033. Graduate Drawing Studio. 3 Hours.

Intensive studio practice in drawing combined with reading, writing, and discussion of relevant contemporary issues in the fields of painting and drawing. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 612V. Graduate Painting. 1-6 Hour.

Individual problems in painting techniques. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6133. Graduate Painting Studio. 3 Hours.

Intensive studio practice in painting combined with reading, writing, and discussion of relevant contemporary issues in the fields of painting and drawing. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 622V. Graduate Sculpture. 1-6 Hour.

Individual problems in sculpture techniques. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

ARTS 6233. Graduate Sculpture Studio. 3 Hours.

Intensive studio practice in sculpture combined with reading, writing, and discussion of relevant contemporary issues in the field of sculpture and new media. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 642V. Graduate Printmaking. 1-6 Hour.

Individual problems in printmaking techniques. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6433. Graduate Printmaking Studio. 3 Hours.

Intensive studio practice in printmaking combined with reading, writing, and discussion of relevant contemporary issues in the fields of printmaking. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

ARTS 652V. Graduate Ceramics. 1-6 Hour.

Individual problems in ceramic techniques. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6533. Graduate Ceramics Studio. 3 Hours.

Discussion of contemporary ceramics issues in tandem with the development of a cohesive body of work. Students lead their own explorations, technically and conceptually, while working toward a professional standard of output. Includes regular critiques, with the class and individually with the instructor. Any ceramic processes may be used. Prerequisite: MFA Studio Art Graduate Standing. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 682V. Graduate Photography. 1-6 Hour.

Individual problems in photography. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6833. Graduate Photography Studio. 3 Hours.

Intensive studio practice with reading and discussion of contemporary issues in photography for MFA students. Prerequisite: Admission to MFA program in Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 695V. Special Topics. 1-6 Hour.

Subject matter not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

Art Education (ARED)

Gerry Snyder
Director of the School of Art
116 Fine Arts Center
479-575-5202

Mathew McConnell
Director of Graduate Studies
116 Fine Arts Center
479-575-5202
Email: msmconn@uark.edu

School of Art Website (<http://art.uark.edu/>)

Degree Conferred:

M.A. in Art Education (ARED)

Program Description: The Master of Arts in Art Education is a two-year, 33 credit, art education program with concentrations in Schools or Community and Museums. The program is designed to enhance student knowledge and practices within the field of art education with a focus on meeting the necessary demands of a diverse and inclusive professional practice. Both concentrations offer a broad range of courses on art and pedagogical theories, visual culture studies, and research methodologies. For the Schools concentration, students will take core research and pedagogy courses as well as electives to build their expertise in an area of interest. The Community and Museums concentration includes the same core courses as well as electives and internship opportunities at local, national, or international museum and community venues. Both concentrations will apply contemporary art education theory, practice, and research as applicable to the students' goals, whether they be preparation for doctoral study or professional practice. The program content will comply with the National Art Education Association (NAEA) and the National Association of Schools of Art and Design (NASAD) standards.

This degree will prepare students to advance their professional roles as artists, teachers, researchers, and leaders in various venues, such as schools, museums, community organizations, and institutions. This degree will advance students' knowledge and professional application in an increasingly diverse, inclusive, and interdisciplinary world serving as a vehicle for community and university cross-disciplinary collaborations including but not limited to—African American Studies; Curriculum and Instruction; Gender Studies; History; Human Development and Family Sciences; Political Science; Psychology; Social Work; Sociology; and World Languages, Literatures, and Cultures.

Requirements for M.A. in Art Education with Community and Museums Concentration

Application Process

Prerequisites to Degree Program: An earned bachelor's degree with an art education major or its equivalent. Consideration will be given to applicants without an art major concentration who present evidence of knowledge in art education, art/visual culture, art history, art theory, and/or community art practice.

Acceptance to the Master of Arts degree program requires a bachelor's degree from an accredited institution of higher education, with a grade point average of 3.0 on the last 60 credit hours of academic coursework OR a 3.0 cumulative grade point average. GRE scores are accepted, but not required for entrance into the program.

In addition to the requirements for admission to the Graduate School, the applicant must also submit the following materials to the School of Art through SlideRoom, a web-based system, uarkart.slideroom.com (<http://uarkart.slideroom.com/>): A brief statement describing why you are interested in the Master of Arts in Art Education concentrations in Schools and/or Community and Museums (a few sentences), a 1-2 page autobiographical statement outlining your education, experiences, achievements, and goals for graduate study in one or both concentrations (Schools and/or Community and Museums), resume/curriculum vitae, optional writing or research sample (maximum of 10 pages), unofficial transcripts, and three names and contact information for references who will be submitting letters of recommendation for the applicant to upload to SlideRoom, and an optional portfolio of 10-20

images (up to 5 of the images may include details if needed for large scale or 3-dimensional work) with the title, medium(s), dimensions, and date of completion. If you are submitting video, provide a website link to sources such as Vimeo or YouTube (size limit 5 MB). SlideRoom has comprehensive instructions for resizing and submitting work online, slideroom.zendesk.com/home (https://slideroom.zendesk.com/hc/en-us/restricted/?return_to=https%3A%2F%2Fslideroom.zendesk.com%2Fhc&locale=en-us).

Application deadline for the School of Art is **Jan. 15** (Fall Admission only). The application portal on Slideroom will close at midnight (Central time) on Jan. 15. It is recommended that you submit your application at least two weeks prior to the deadline to allow your faculty recommenders time to upload their letters. The GRE is not required for applicants to the M.A. program in Art Education at the School of Art at the University of Arkansas, but may be submitted with the application.

Requirements for the Master of Arts in Art Education: Complete a minimum of 33 credit hours.

Core Curriculum	9
ARED 5003 Research Methodologies in Art Education	3
ARED 6003 Foundations and Histories of Art Education	3
ARED 5013 (Dis)Mantling Diversity & Pedagogy	3
ARED 698V Master's Thesis in Art Education	1-6
Concentration Hours	18

Additional Requirements for the Concentration in Community and Museums:

Selection of courses must be in consultation with an adviser

Graduate credit hours in Art Education	9
Graduate credit hours outside of Art Education	6
ARED 686V Internship in Art Education	3
Total Hours	18

Requirements for M.A. in Art Education with Schools Concentration

Application Process

Prerequisites to Degree Program: An earned bachelor's degree with an art education major or its equivalent. Consideration will be given to applicants without an art major concentration who present evidence of knowledge in art education, art/visual culture, art history, art theory, and/or community art practice.

Acceptance to the Master of Arts degree program requires a bachelor's degree from an accredited institution of higher education, with a grade point average of 3.0 on the last 60 credit hours of academic coursework OR a 3.0 cumulative grade point average. GRE scores are accepted, but not required for entrance into the program.

In addition to the requirements for admission to the Graduate School, the applicant must also submit the following materials to the School of Art through SlideRoom, a web-based system, uarkart.slideroom.com (<http://uarkart.slideroom.com/>): A brief statement describing why you are interested in the Master of Arts in Art Education concentrations in Schools and/or Community and Museums (a few sentences), a 1-2 page autobiographical statement outlining your education, experiences, achievements, and goals for graduate study in one or both concentrations (Schools and/or Community and Museums), resume/curriculum

vitae, optional writing or research sample (maximum of 10 pages), unofficial transcripts, and three names and contact information for references who will be submitting letters of recommendation for the applicant to upload to SlideRoom, and an optional portfolio of 10-20 images (up to 5 of the images may include details if needed for large scale or 3-dimensional work) with the title, medium(s), dimensions, and date of completion. If you are submitting video, provide a website link to sources such as Vimeo or YouTube (size limit 5 MB). SlideRoom has comprehensive instructions for resizing and submitting work online, slideroom.zendesk.com/home (https://slideroom.zendesk.com/hc/en-us/restricted/?return_to=https%3A%2F%2Fslideroom.zendesk.com%2Fhc&locale=en-us).

Application deadline for the School of Art is **Jan. 15** (Fall Admission only). The application portal on Slideroom will close at midnight (Central time) on Jan. 15. It is recommended that you submit your application at least two weeks prior to the deadline to allow your faculty recommenders time to upload their letters. The GRE is not required for applicants to the M.A. program in Art Education at the School of Art at the University of Arkansas, but may be submitted with the application.

Requirements for the Master of Arts in Art Education: Complete a minimum of 33 credit hours.

Core Curriculum	9
ARED 5003 Research Methodologies in Art Education	3
ARED 6003 Foundations and Histories of Art Education	3
ARED 5013 (Dis)Mantling Diversity & Pedagogy	3
ARED 698V Master's Thesis in Art Education	1-6
Concentration Hours	18

Additional Requirements for the Concentration in Schools:

Selection of courses must be in consultation with an adviser

Graduate Credit hours in Art Education	12
Graduate Credit hours outside of Art Education	6
Total Hours	18

Graduate Faculty in the School of Art

- Andree, David**, M.F.A. (State University of New York), B.F.A. (Minneapolis College of Art and Design), Assistant Professor, 2015.
- Andree, Kara M.**, M.F.A. (State University of New York at Buffalo), B.F.A. (Minneapolis College of Art and Design), Instructor, 2016.
- Byrd, Stefani**, M.F.A. (University of California, San Diego), Visiting Assistant Professor, 2019.
- Callander, Adrienne**, M.F.A. (Rutgers University), B.A. (Reed College), Visiting Assistant Professor, 2017.
- Callander, Neil**, M.F.A. (Rutgers University), B.F.A. (Indiana University at Bloomington), Assistant Professor, 2017.
- Cassiano Alvarez, Renata**, M.F.A. (University of Massachusetts-Dartmouth), Instructor, 2019.
- Chioffi, David Charles**, M.A. (Wesleyan University), B.F.A. (The Rochester Institute of Technology), Professor, 2013.
- Cromer, Jonathan Barrett**, M.F.A. (University of Arkansas, Instructor, 2016.
- DeLue, Rachael Z.**, Ph.D. (John Hopkins University), Visiting Assistant Professor, 2019.
- DeWitt, Dylan**, M.F.A. (Yale University), Assistant Professor, 2014.
- Doyle, Allen P.**, Ph.D. (Princeton University), Visiting Assistant Professor, 2019.

Drolen, Rebecca, M.F.A., B.A. (Indiana University, Bloomington), Assistant Professor, 2015.

Edwards, Vincent A., M.F.A. (Herron School of Art and Design), B.F.A. (Indiana University), Instructor, 2016.

Grant, Alphonso W., Ph.D. (Pennsylvania State University), Assistant Professor, 2017.

Hanson, Alexander J., M.F.A. (University of Iowa), Instructor, 2015.

Hapgood, Thomas Layley, M.F.A., B.A. (University of Arizona), Associate Professor, 2005.

Hogan, Adam S., M.A., M.F.A. (Washington University in St. Louis), Assistant Professor, 2014.

Hulen, Jeannie, M.F.A. (Louisiana State University), B.F.A. (Kansas City Art Institute), Professor, 2002.

Jacobs, Lynn Frances, Ph.D., M.A. (New York University), B.A. (Princeton University), Distinguished Professor, 1989.

King, Sam, M.F.A. (Indiana University at Bloomington), B.F.A. (University of Tulsa), Assistant Professor, 2011.

Lane, Marty Maxwell, M.G.D. (North Carolina State University), B.F.A. (University of Illinois at Chicago), Associate Professor, 2014.

LaPorte, Angela M., Ph.D. (Pennsylvania State University), M.A. (Arizona State University), B.S. (La Roche College), Professor, 1998.

Layiwola, Adepeju, Ph.D. (University of Ibadan, Nigeria), Visiting Professor, 2019.

Lee, Oh Mee, M.A. (University of Oregon), Visiting Assistant Professor, 2019.

Levenson, Abra, Ph.D., M.A. (Princeton), B.A. (University of California, Berkeley), Assistant Professor, 2018.

Lopez, Linda Nguyen, M.F.A. (University of Colorado-Boulder), B.F.A. (California State University-Chico), Instructor, 2012.

McConnell, Mathew S., M.F.A. (University of Colorado-Boulder), B.F.A. (Valdosta State University), Associate Professor, 2011.

McMahon, Bree, M.A., B.A. (North Carolina State University), Assistant Professor, 2018.

Mearns, Ian, M.F.A. (Penn State), M.F.A. (University of California at Irvine), Instructor, 2017.

Mitchell, Marc E., M.F.A. (Boston University), Associate Professor, 2014.

Morrissey, Sean P., M.F.A. (University of Nebraska-Lincoln), B.F.A. (Bowling Green State University), Assistant Professor, 2014.

Murff, Zora J., M.F.A. (University of Nebraska), Assistant Professor, 2018.

Musgnug, Kristin Ann, M.F.A. (Indiana University at Bloomington), B.A. (Williams College), Associate Professor, 1991.

Place, Alison L., M.F.A. (Miami University), Assistant Professor, 2017.

Posnak, Adam, M.F.A. (Louisiana State University and A&M College), Instructor, 2010.

Pulido Rull, Ana, Ph.D., M.A. (Harvard University), B.A. (National Autonomous University of Mexico), Associate Professor, 2012.

Ramirez, Kasey, M.F.A. (Indiana University, Bloomington), B.F.A. (Rhode Island School of Design), Assistant Professor, 2015.

Schulte, Christopher M., Ph.D. (Pennsylvania State University), Associate Professor, 2019.

Sichel, Jennifer A., Ph.D. (University of Chicago), Visiting Assistant Professor, 2019.

Slone, Ryan B., B.F.A. (University of Arkansas), Instructor, 2001.

Snyder, Gerry, M.A. (New York University), B.F.A. (University of Oregon), Distinguished Professor, 2019.

Springer, Bethany Lynn, M.F.A. (University of Georgia), B.A. (Virginia Polytechnic Institute and State University), Associate Professor, 2006.

Sytsma, Janine A., Ph.D. (University of Wisconsin-Madison), M.A. (University of Denver), B.A. (Arizona State University), Assistant Professor, 2016.

Taoka, Loring, M.F.A. (University of North Texas), Instructor, 2012.

Trammell, Breanne M., M.F.A. (Rhode Island School of Design), Assistant Professor, 2019.

Turner, Aaron, M.F.A. (Rutgers State University), B.A. (University of Memphis), Research Associate, 2016.

Yoon, InJeong, Ph.D. (University of Arizona), Assistant Professor, 2017.

Young, Chase R., M.F.A. (University of Arkansas), Instructor, 2019.

Young, Rana N., M.F.A. (University of Nebraska), Visiting Assistant Professor, 2019.

Asian Studies (AIST)

Ka Zeng
Chair of Studies
428 Old Main
479-575-3356

Courses

JAPN 5313. Language and Society of Japan. 3 Hours.

(Formerly JAPN 4313.) The primary objective of this course is to investigate the way the Japanese language reflects the beliefs and custom of the Japanese people as a social group. For comparison purposes, this course makes reference to studies in American language and culture. Proficiency in Japanese not required. Graduate degree credit will not be given for both JAPN 4313 and JAPN 5313. (Typically offered: Fall)

JAPN 5333. Professional Japanese I: Business Writing. 3 Hours.

(Formerly JAPN 4333.) This course aims to familiarize the students with formats, vocabulary, and expressions in Japanese business correspondence. Emphasizes career-ready Japanese language proficiency. Graduate degree credit will not be given for both JAPN 4333 and JAPN 5333. Prerequisite: JAPN 3116 or equivalent Japanese proficiency. (Typically offered: Spring)

Athletic Training (ATTR)

Matthew S. Ganio
Department Head, Health, Human Performance and Recreation
306 HPER Building
479-575-2857
Email: msganio@uark.edu

Paul Calleja
Assistant Department Head and Graduate Coordinator
306C HPER Building
479-575-2854
Email: pcallej@uark.edu

Health, Human Performance and Recreation Website (<http://hhpr.uark.edu/>)

Degrees Conferred:

M.At. in Athletic Training (ATTR)

Program Description: The Master of Athletic Training degree program prepares individuals for employment as athletic trainers for high school, college, professional sports organizations, and private clinics, military, performing arts, and industry. The Master of Athletic Training degree requires 56-59 credit hours of course work to graduate. The student is offered the opportunity to interact with high quality researchers, teachers, and preceptors throughout the two and a half years of course work, clinical rotations, and the research thesis or experience.

The graduate athletic training program (GATP) is a pre-certification program in athletic training and is not intended for students who are already eligible to sit for or have passed the Board of Certification (BOC)

examination. This is a full-time graduate program that begins in the first summer term each year, and requires considerable clinical experience as part of the requirements for graduation. This is a competitive master's program that requires admission to the University of Arkansas Graduate School and the GATP.

M.At. in Athletic Training

Prerequisites to Athletic Training Degree Program: For acceptance to the Graduate Athletic Training Program, in addition to the general requirements for admission to the Graduate School, an undergraduate degree in exercise science or in a related field and an overall undergraduate GPA of 3.00, GRE score and prerequisite courses are required. GPA of no less than 3.0 was changed from previous three-tiered GPA requirements and submission of a GRE score.

Prerequisite Courses for Admission to the Master of Athletic

Training: Students desiring admission to the athletic training program must complete the following courses prior to admission:

NUTR 1213	Fundamentals of Nutrition	3
EXSC 3153	Exercise Physiology	3
BIOL 1543 & BIOL 1541L	Principles of Biology (ACTS Equivalency = BIOL 1014 Lecture) and Principles of Biology Laboratory (ACTS Equivalency = BIOL 1014 Lab)	4
BIOL 2213 & BIOL 2211L	Human Physiology (ACTS Equivalency = BIOL 2414 Lecture) and Human Physiology Laboratory (ACTS Equivalency = BIOL 2414 Lab)	4
BIOL 2443 & BIOL 2441L	Human Anatomy (ACTS Equivalency = BIOL 2404 Lecture) and Human Anatomy Laboratory (ACTS Equivalency = BIOL 2404 Lab)	4
CHEM 1103 & CHEM 1101L	University Chemistry I (ACTS Equivalency = CHEM 1414 Lecture) and University Chemistry I Laboratory (ACTS Equivalency = CHEM 1414 Lab)	4
	or CHEM 1203 Chemistry for Majors I & CHEM 1201L and Chemistry for Majors I Laboratory	
PHYS 2013 & PHYS 2011L	College Physics I (ACTS Equivalency = PHYS 2014 Lecture) and College Physics I Laboratory (ACTS Equivalency = PHYS 2014 Lab)	4
PSYC 2003	General Psychology (ACTS Equivalency = PSYC 1103)	3

If the above courses were obtained at a college or university other than the University of Arkansas, course syllabi/outlines for courses that are requested to meet the requirements must be submitted to the Program Director of Athletic Training Program for approval.

Students who desire consideration for admission to the Graduate Athletic Training Program must submit the following information:

1. Each student must provide evidence of a preprogram physical examination based on the University of Arkansas graduate athletic training program's technical standards by a board certified physician (DO or MD);
2. Evidence of immunizations (mumps, measles, rubella, tetanus, and diphtheria);

3. Hepatitis B vaccination or waiver prior to beginning the clinical field based experience (the University of Arkansas Student Health Center offers the Hepatitis B vaccination for \$120.00 for all three shots);
4. A minimum of 150 hours of observation under the direct supervision of a BOC certified athletic trainer; -
5. Three professional letters of recommendation;
6. Completion of the University of Arkansas Graduate School Application – see the Athletic Training website (admission into the graduate athletic training program is selective, and therefore, admission to the Graduate School of the University of Arkansas does not guarantee admission into the Graduate Athletic Training Program);
7. Completion of the GATP Application (see GATP Web site (<https://atep.uark.edu/>));
8. Background check – All expenses incurred by the back ground are the responsibility of the student. – Background check information is located on the GATP website (<https://atep.uark.edu/>).
9. An official copy of all transcripts; and
10. All prospective students must satisfy required athletic training technical standards.

Technical Standards: Because the Master of Athletic Training degree and BOC certification signifies that the holder is a clinician prepared for entry into the practice of athletic training within a variety of employment and education settings, it follows that graduates must have the knowledge and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care. Therefore, the students must meet technical standards before being admitted to the Athletic Training Education Program. The technical standards set forth by the Athletic Training Educational Program establish the essential qualities considered necessary for students admitted to this program to achieve the knowledge, skills, and competencies of an entry-level athletic trainer, as well as meet the expectations of the program's accrediting agency (Commission on Accreditation for Athletic Training Education (CAATE). Applicants who may not meet these technical standards are encouraged to contact the Program Director of Athletic Training Education, 303 HPER Building, University of Arkansas. The following are the technical standards:

1. Candidates must be able to actively learn from observations, demonstrations, and experiments in the basic sciences.
2. Candidates must be able to learn to analyze, synthesize, solve problems, and reach assessment and therapeutic judgments distinguished from the norm.
3. Candidates must have sufficient sensory function and coordination to perform appropriate physical examinations using acceptable techniques.
4. Candidates must be able to relate effectively to athletes and the physically active and to establish sensitive, professional relationships with them.
5. Candidates are expected to be able to communicate the results of the assessment to the injured or ill exerciser, to responsible officials, to parents or guardians, and to colleagues with accuracy, clarity, and efficiency.
6. Candidates are expected to learn and perform routine prevention, assessment, emergency care, and therapeutic procedures.
7. Candidates are expected to be able to display good judgment in the assessment and treatment of injured or ill athletes and physically active individuals.
8. Candidates must be able to learn to respond with precise, quick, and appropriate action in emergency situations.

9. Candidates are expected to be able to accept criticism and respond by appropriate modification of behavior.
10. Candidates are expected to possess the perseverance, diligence, and consistency to complete the athletic training degree curriculum as outlined and sequenced, to attempt BOC certification within the year of program completion, and to enter the practice of athletic training.

Academic Retention Policy:

All graduate students are subject to the Graduate School Policies (p. 424).

In addition to the graduate school policies, the Graduate Athletic Training Program has adopted a more stringent set of academic guidelines.

Students will be retained and progress through the ATP by meeting the following requirements:

1. Follow all GATP Policies as noted in the GATP policy and procedure manual.
2. Only those that have a graduate GPA of #3.0 will be cleared for graduation from the GATP. In addition, no credit is earned for courses in which a grade of "F" or "D" is recorded (but these courses count towards GPA). Courses in which a grade of 'F' or 'D' are earned must be retaken, and a passing grade ("C" or better) must be earned prior to graduation. The maximum number of credit hours that can be retaken is 6 hours.
3. At the end of each semester (i.e., August, December and May), student progress will be assessed. Students will be placed on probation if:
 - a. Cumulative GPA is less than or equal to a 2.85 (student will receive a letter from the graduate school) or the student earned two "C"s or lower in the semester being evaluated (student will receive a letter from the athletic training program director).
4. Students on probation will be reassessed at the end of the following semester. Re-assessment will determine if the student is removed from probation, or is dismissed from the program.
 - a. Student removed from probation: If the student earns greater than a "C" in all coursework during the probation semester AND the cumulative GPA is greater than 2.85.
 - b. Student is dismissed from the program: If the student earns any grade less than a "B" during the probation semester (regardless of cumulative GPA).

A student cannot graduate while on probation. If they are on probation during their final semester, a student must earn a "B" or greater in all of their coursework. Likewise, their final cumulative GPA must be greater than or equal to a 3.00 (see point 2 above).

BOC for Athletic Training Exams:

1. If the student is on probation during their final semester (Spring 2nd year), they will not be cleared to take the Jan/Feb or March/April BOC for athletic training exam.
 - a. At the semester midterm, student progress will be assessed. If it is determined that the student is on track to earn a 'B' or greater in all coursework, as determined by the instructor, the student will be cleared to take the May/June BOC for athletic training exam.
 - b. If it is determined the student is at risk to earn a "C" or less in any of their courses, the student will not be cleared for the May/June

exam. In that case, the student will only be cleared to take the BOC for athletic training exam once the student has successfully graduated from the program.

Requirements for the Master of Athletic Training Degree:

Candidates for the Master of Athletic Training degree must complete 53 semester hours of graduate work and an independent research project or thesis. A graduate GPA of 3.0 or better is required for graduation. In addition, all degree candidates must successfully complete the required athletic training competencies and proficiencies as mandated by the accrediting body.

Athletic Training: (59-62 hours)

Required Research Component (3 hours)

ESRM 5393	Statistics in Education and Health Professions	3
or ESRM 6403	Educational Statistics and Data Processing	

HHPR Required Courses (53 hours)

ATTR 5213	Athletic Training Clinical I - Application of Injury Prevention Devices and Techniques	3
ATTR 5223	Athletic Training Clinical II - Emergency Procedures	3
ATTR 5232	Athletic Training Clinical III - Lower Extremity Evaluation	2
ATTR 5242	Athletic Training Clinical IV - Evaluation of Upper Extremity	2
ATTR 5262	Athletic Training Clinical V - Rehabilitation Lab	2
ATTR 5272	Athletic Training Clinical VI - Athletic Training Seminar	2
ATTR 5253	Professionalism in Athletic Training	3
ATTR 5313	Clinical Anatomy for Athletic Trainers	3
ATTR 5363	Evaluation Techniques of Athletic Injuries - Upper Extremity	3
ATTR 5373	Evaluation Techniques of Athletic Injuries - Lower Extremity	3
ATTR 5403	Pathophysiology and Treatment I	3
ATTR 5413	Pathophysiology and Treatment II	3
ATTR 5453	Therapeutic Modalities in Athletic Training	3
ATTR 5463	Therapeutic Exercise and Rehabilitation of Athletic Injuries	3
ATTR 5473	Administration in Athletic Training	3
ATTR 5493	Evidence-Based Practice in Athletic Training	3
EXSC 5323	Biomechanics I	3
EXSC 5593	Practicum in Laboratory Instrumentation	3
EXSC 5643	Advanced Psychology of Sports Injury and Rehabilitation	3

Required Project or Thesis (3-6 hours)

KINS 589V	Independent Research	3-6
or KINS 600V	Master's Thesis	

Total Hours 59-62

Courses

ATTR 5213. Athletic Training Clinical I - Application of Injury Prevention Devices and Techniques. 3 Hours.

This course will serve as an introduction to the athletic training clinical program. Procedures and policies of the clinical program and application of athletic preventive devices will be included as well. Corequisite: ATTR 5223. Prerequisite: Admission to the graduate program in athletic training. (Typically offered: Summer)

ATTR 5223. Athletic Training Clinical II - Emergency Procedures. 3 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce and instruct new emergency procedures. Corequisite: ATTR 5213. (Typically offered: Summer)

ATTR 5232. Athletic Training Clinical III - Lower Extremity Evaluation. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training proficiencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce the evaluation skills of gait, lower extremity, and spine/pelvis. Prerequisite: ATTR 5223. (Typically offered: Fall)

ATTR 5242. Athletic Training Clinical IV - Evaluation of Upper Extremity. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce the evaluation skills of the upper extremities, head, neck, and posture. Prerequisite: ATTR 5232. (Typically offered: Spring)

ATTR 5253. Professionalism in Athletic Training. 3 Hours.

This course has dual purposes: to educate students on athletic training educational competencies related to professionalism and professional responsibility in the field of athletic training; and to provide an immersive clinical experience under the direct supervision of a preceptor as required by the accrediting body. Students will engage with information about professionalism in both the course material and the clinical experience. (Typically offered: Summer)

ATTR 5262. Athletic Training Clinical V - Rehabilitation Lab. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce techniques and applications of therapeutic exercise and rehabilitation. (Typically offered: Fall)

ATTR 5272. Athletic Training Clinical VI - Athletic Training Seminar. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and serve as a capstone course validating the athletic training clinical proficiencies and prepare students for the NATABOC certification exam and future employment. Prerequisite: ATTR 5262. (Typically offered: Spring)

ATTR 5313. Clinical Anatomy for Athletic Trainers. 3 Hours.

Instruction of human anatomy for the athletic training professional using lecture, diagrams, textbook readings, and demonstrations. Focus will be placed on anatomy of structures related to athletic injuries; and can be used in the evaluation, treatment, and rehabilitation of injuries in a variety of athletic training settings. Prerequisite: Acceptance into the graduate athletic training program or instructor consent. (Typically offered: Summer)

ATTR 5363. Evaluation Techniques of Athletic Injuries - Upper Extremity. 3 Hours.

Use of scientific assessment methods to recognize and evaluate the nature and severity of athletic injuries to the upper extremities, trunk, and head. Prerequisite: Admission to graduate athletic training program. (Typically offered: Spring)

ATTR 5373. Evaluation Techniques of Athletic Injuries - Lower Extremity. 3 Hours.

Use of scientific assessment methods to recognize and evaluate the nature and severity of athletic injuries to the hip and lower extremities. Prerequisite: Admission to graduate athletic training program. (Typically offered: Fall)

ATTR 5403. Pathophysiology and Treatment I. 3 Hours.

This course will provide knowledge, skills, and values that the entry-level athletic trainer must possess to prevent, recognize, treat, advise on medications for and, when appropriate, refer general medical conditions and disabilities of physically active individuals. Prerequisite: Admission to the athletic training program. (Typically offered: Spring)

ATTR 5413. Pathophysiology and Treatment II. 3 Hours.

This course will provide knowledge, skills, and values that the entry-level athletic trainer must possess to prevent, recognize, treat, advise on medications for and, when appropriate, refer general medical conditions and disabilities of physically active individuals. Prerequisite: ATTR 5403. (Typically offered: Fall)

ATTR 5453. Therapeutic Modalities in Athletic Training. 3 Hours.

Contemporary therapeutic modalities used in managing athletic injuries. Modalities covered are classified as thermal agents, electrical agents, or mechanical agents. Emphasis is placed on their physiological effects, therapeutic indications (and contraindications), and clinical application. Prerequisite: Admission to graduate athletic training program. (Typically offered: Fall)

ATTR 5463. Therapeutic Exercise and Rehabilitation of Athletic Injuries. 3 Hours.

A systematic approach to exercise program development, techniques, indications and contraindications of exercise, and progression as related to athletic injury, prevention, and return to play guidelines. Prerequisite: Admission to graduate athletic training program. (Typically offered: Fall)

ATTR 5473. Administration in Athletic Training. 3 Hours.

Administrative components of athletic training. Basic concepts of legal liability, leadership and management principles, financial management, day to day scheduling and supervision, maintenance, and general administration. Prerequisite: Admission to graduate athletic training program. (Typically offered: Summer)

ATTR 5483. Medical Conditions in Athletic Training. 3 Hours.

This course will provide a collection of knowledge, skills, and values that the entry-level certified athletic trainer must possess to recognize, treat, and refer, when appropriate, the general medical conditions and disabilities of athletes and others involved in physical activity. Prerequisite: Admission to the graduate athletic training program or permission of instructor. (Typically offered: Fall)

ATTR 5493. Evidence-Based Practice in Athletic Training. 3 Hours.

In-depth analysis of current literature, research, case studies, and musculoskeletal evaluation and rehabilitation directed toward musculoskeletal injuries of the physically active. Prerequisite: Admission into the Athletic Training Education Program. (Typically offered: Summer)

Biological Sciences (BISC)

David S. McNabb
Department Chair
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Department of Biological Sciences Website (<http://fulbright.uark.edu/departments/biology/>)

Degrees Conferred:
M.S., Ph.D. in Biology (BIOL)

Program Description: The graduate programs in Biological Sciences offer opportunity for advanced study and research to students who desire a comprehensive view of biological sciences. Accomplishment is judged by competence and a developing sense of responsibility for the advancement of knowledge rather than the fulfillment of routine requirements. The faculty requires of all candidates for advanced degrees a period of study in residence, advanced competence in the chosen area of expertise, satisfactory introduction to allied subjects, the ability to communicate at a scholarly level, and a satisfactory performance in examinations.

Primary Areas of Faculty Research: Cell and molecular biology (biotechnology, cellular physiology, functional genomics, gene regulation, immunology, developmental biology, molecular genetics, pathogenic microbiology); ecology and evolutionary biology (animal behavior, aquatic ecology, animal and plant physiology, conservation biology, community ecology, exobiology, fisheries biology, limnology, molecular systematics, mycology, physiological ecology, plant morphology, population and quantitative genetics, taxonomy, vertebrate biology — herpetology, ichthyology, mammalogy, ornithology — and wildlife management).

M.S. in Biology

Admission to Degree Program: Applicants who wish to study for advanced degrees are expected to present a minimum of 18 hours of biological science. These normally will include training in the three areas of the Biology Subject test of the Graduate Record Examinations: a) cellular and molecular biology, b) organism biology, and c) ecology, evolution, and population biology. Applicants lacking experience in any of the above areas will be expected to broaden their biological training and may be assigned specific course work to fulfill this requirement. Students lacking a total of 18 hours of biological sciences may be admitted on a conditional basis and are not eligible for assistantships. All students applying for admission to the graduate program must provide scores on the verbal, quantitative, and analytical writing sections of the Graduate Record Examinations. Those scores, along with transcripts and three letters of recommendation, will be used in evaluating applications of students applying for assistantships.

All students must have a major professor to enter the graduate program in biological sciences. Ultimately each candidate will have a committee composed of members of the graduate faculty and the student's major professor. Students must also fulfill the Graduate School's residency requirements, which are stated elsewhere in this catalog.

All students are required to earn credit in two graduate seminars. Additional seminar requirements may be specified by the major professor in conjunction with the graduate committee. Students are required to present a research seminar prior to the oral thesis or dissertation defense.

Requirements for the Master's Degree: The Master of Science degree requires 30 semester hours of graduate credit specified by the department to include at least 24 semester hours of course credit and thesis research. Any student who receives a grade of "D" or "F" in any graduate-level course will be subject to dismissal following review by the Graduate Studies Committee. Master of Science students are required to enroll in BIOL 600V for 6 hours of credit and to submit a scholarly thesis based on field and/or laboratory research. A specific coursework program will be selected under the guidance of the student's major professor and graduate committee. An oral comprehensive examination is required of all candidates, including a defense of the thesis, which will follow their research seminar.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Biology

Specific Requirements for the Doctor of Philosophy Degree: There are no formal course requirements for doctoral students, except that all graduate students in biology are required to earn credit in two graduate seminars. However, students complete a minimum of 72 graduate semester hours if entering the Ph.D. program without a master's degree, or 42 graduate semester hours beyond the master's degree. A minimum of 18 hours must be taken in dissertation credit; these will count in the minimums mentioned in the previous sentence. Any student who receives a grade of "D" or "F" in any graduate-level course will be subject to dismissal following review by the Graduate Studies Committee. Any student receiving more than two grades of "C" in courses of two or more credit hours is no longer eligible for the Ph.D. degree, but may elect to complete an M.S. degree in the program. The Ph.D. is granted not only for fulfillment of technical requirements, but also for development and possession of a critical and creative ability in science and fruitful expression of imagination. Evidence of this is given in the dissertation that the candidate prepares, which constitutes an original research contribution to the fields of the biological sciences.

The Graduate School requires two examinations of all students pursuing the Doctor of Philosophy degree. These examinations are designed to assist students in developing the ability to communicate at a scholarly level and to show they have attained intellectual mastery of knowledge relating to the biological sciences. The first examination, the Candidacy Examination, contains questions related to the student's field of interest and such other areas as the doctoral committee may specify. This examination is given by the doctoral advisory committee in two parts, written and oral. The written and oral portions of the candidacy examination must be completed within the first three calendar years in the program. Satisfactory performance on this examination will be indicated by either pass or fail as determined by the doctoral committee. In the event of failure, the examination may be repeated at the discretion of the doctoral committee. In no case may the candidacy examination be taken more than twice. Notification to the Graduate School of failure to pass the Candidacy Examination means that the student is dismissed from the Ph.D. program, and the student is not eligible for readmission into the Biology program to pursue the Ph.D. degree. The second examination, the oral Final Examination, preceded by a research seminar, is primarily concerned with the candidate's dissertation and is taken at the end of the candidate's program.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Alrubaye, Adnan A., Ph.D., M.Ed. (University of Arkansas), M.Sc. (University of Baghdad), Research Assistant Professor, 2013.
Alverson, Andrew James, Ph.D. (University of Texas at Austin), M.S. (Iowa State University), B.S. (Grand Valley State University), Associate Professor, 2012.
Bailey, Tameka A., Ph.D. (University of Arkansas), B.S. (University of Arkansas-Pine Bluff), Research Assistant Professor, 2017.
Beaulieu, Jeremy M., Ph.D. (Yale University), M.S., B.S. (California Polytechnic State University), Assistant Professor, 2016.
Beaupre, Steven J., Ph.D. (University of Pennsylvania), M.S., B.S. (University of Wisconsin), Professor, 1995.
Catanzaro, Donald G., Ph.D. (University of Arkansas), A.B. (University of California, Los Angeles), Research Assistant Professor, 2014.

Ceballos, Ruben M., Ph.D. (University of Montana), M.A. (University of Alabama-Birmingham), B.S. (University of Alabama-Huntsville), Assistant Professor, 2016.

Coleman, James S., Ph.D., M.S., M.Phil (Yale University), B.S. (University of Maine), Professor, 2017.

Douglas, Marlis R., Ph.D., M.S., B.S. (University of Zurich), Professor, 2012.

Douglas, Michael Edward, Ph.D. (University of Georgia), M.S., B.S. (University of Louisville), Professor, 2011.

Du, Yuchun, Ph.D. (Kagoshima University, Japan), B.S. (Shaanxi University of Technology, China), Associate Professor, 2007.

DuRant, Sarah Elizabeth, Ph.D. (Virginia Polytechnic Institute and State University), B.S. (University of South Carolina), Assistant Professor, 2017.

Durdik, Jeannine M., Ph.D. (Johns Hopkins University), B.S. (Purdue University), Professor, 1994.

Etges, William J., Ph.D. (University of Rochester), M.S. (University of Georgia), B.S. (North Carolina State University), Professor, 1987.

Evans, Timothy A., Ph.D. (Indiana University), B.S. (Slippery Rock University), Associate Professor, 2013.

Evans-White, Michelle Allayne, Ph.D. (University of Notre Dame), M.S., B.S. (Kansas State University), Professor, 2008.

Forbes, Kristian M., Ph.D. (University of Jyväskylä), M.P.H. (Latrobe University), B.Sc. (Latrobe University), Assistant Professor, 2018.

Henry, Ralph Leroy, Ph.D., M.S. (Kansas State University), B.S.E. (University of Kansas), Distinguished Professor, 1996.

Ivey, Mack, Ph.D., B.S. (University of Georgia), Associate Professor, 1992.

Iyer, Shilpa, Ph.D. (University of Georgia), M.Sc., B.Sc. (University of Pune, India), Assistant Professor, 2016.

Kral, Timothy Alan, Ph.D. (University of Florida), B.S. (John Carroll University), Professor, 1981.

Lehmann, Michael Herbert, Ph.D., Diploma in Biology (Philipps University of Marburg, Germany), Professor, 2002.

Lessner, Daniel J., Ph.D. (University of Iowa), B.S. (University of Wisconsin-Stevens Point), Associate Professor, 2008.

Lewis, Jeffrey A., Ph.D. (University of Wisconsin-Madison), B.S. (University of California-Santa Barbara), Assistant Professor, 2013.

Magoulick, Daniel D., Ph.D. (University of Pittsburgh), M.S. (Eastern Michigan University), B.S. (Michigan State University), Research Professor, 2000.

McNabb, David S., Ph.D. (Louisiana State University Health Sciences Center), B.S. (University of Texas at Arlington), Associate Professor, 2000.

Naithani, Kusum, Ph.D. (University of Wyoming), M.Sc. (G.B. Pant University of Agriculture and Technology-India), B.Sc. (University of Lucknow-India), Assistant Professor, 2014.

Nakanishi, Nagayasu, Ph.D. (University of California, Los Angeles), B.S. (University of California, San Diego), Assistant Professor, 2017.

Pare, Adam C., Ph.D. (University of California, San Diego), B.S. (Cornell University), Assistant Professor, 2019.

Pinto, Ines, Ph.D. (Louisiana State University Health Sciences Center), M.S., B.S. (University of Chile), Associate Professor, 2000.

Rhoads, Douglas Duane, Ph.D. (Kansas State University), M.A., B.A. (Wichita State University), University Professor, 1990.

Siepielski, Adam M., Ph.D. (University of Wyoming-Laramie), M.S. (New Mexico State University), B.S. (Pennsylvania State University-University Park), Associate Professor, 2015.

Spiegel, Frederick W., Ph.D. (University of North Carolina at Chapel Hill), B.A. (Drew University), Distinguished Professor, 1982.

Stephenson, Steven Lee, Ph.D., M.S. (Virginia Polytechnic Institute and State University), B.S. (Lynchburg College), Research Professor, 2003.

Tipmark, Christian K., Ph.D., M.S. (University of Southern Denmark), Associate Professor, 2010.

Walker, James M., Ph.D. (University of Colorado-Boulder), M.S., B.S. (Louisiana Polytechnic Institute), Professor, 1965.

Westerman, Erica L., Ph.D. (Yale University), M.Sc. (University of New Hampshire), B.S. (Yale University), Assistant Professor, 2016.

Willson, John David, Ph.D. (University of Georgia), B.S. (Davidson College), Associate Professor, 2012.

Courses

BIOL 5001. Seminar in Biology. 1 Hour.

Discussion of selected topics and review of current literature in any area of the biological sciences. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

This course is cross-listed with CEMB 5911.

BIOL 5003L. Laboratory in Prokaryote Biology. 3 Hours.

Laboratory techniques in prokaryote culture, identification, physiology, metabolism, and genetics. Laboratory 6 hours per week. Prerequisite: BIOL 3123. (Typically offered: Fall and Spring)

BIOL 5024. Insect Diversity and Taxonomy. 4 Hours.

(Formerly BIOL 4024.) Principles and practices of insect classification and identification with emphasis on adult insects. 2.5 hours lecture, 4 hours lab. Previous knowledge of basic entomology is necessary. Graduate degree credit will not be given for both BIOL 4024 and BIOL 5024. Prerequisite: Instructor consent.

Corequisite: Lab component. (Typically offered: Fall)

This course is cross-listed with ENTO 5024.

BIOL 5034. Wildlife Management Techniques. 4 Hours.

(Formerly BIOL 4734.) To familiarize students with techniques used in the management of wildlife populations. Students will be exposed to field methods, approaches to data analysis, experimental design, and how to write a scientific paper. Management applications will be emphasized. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4734 and BIOL 5034. Corequisite: Lab component. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5053. Insect Ecology. 3 Hours.

(Formerly BIOL 4053.) Teaches important ecological concepts through study of dynamic relationships among insects and their environment. Introduces literature of insect ecology, and interpretation and critique of ecological research. Previous knowledge of basic entomology and/or ecology will be assumed. 2 hours lecture/2 hours lab. Graduate degree credit will not be given for both BIOL 4053 and BIOL 5053. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Fall Even Years)

This course is cross-listed with ENTO 5053.

BIOL 5104. Taxonomy of Flowering Plants. 4 Hours.

(Formerly BIOL 4104.) Identifying, naming, and classifying of wildflowers, weeds, trees, and other flowering plants. Emphasis is on the practical aspects of plant identification. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4104 and BIOL 5104. Corequisite: Lab component. Prerequisite: BIOL 1613 and BIOL 1611L and BIOL 2323 and BIOL 3023. (Typically offered: Spring)

BIOL 5113. Insect Behavior and Chemical Ecology. 3 Hours.

Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Spring Even Years)

This course is cross-listed with ENTO 5113.

BIOL 5122. Food Microbiology. 2 Hours.

(Formerly BIOL 4122.) The study of food microbiology including classification/taxonomy, contamination, preservation and spoilage of different kinds of foods, pathogenic microorganisms, food poisoning, sanitation, control and inspection and beneficial uses of microorganisms. Graduate degree credit will not be given for both BIOL 4122 and BIOL 5122. Prerequisite: BIOL 2013 and BIOL 2011L or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with FDSC 5122.

BIOL 5124. Dendrology. 4 Hours.

(Formerly BIOL 4114.) Morphology, classification, geographic distribution, and ecology of woody plants. Lecture 3 hours, laboratory 3 hours per week, and fieldtrips. Graduate degree credit will not be given for both BIOL 4114 and BIOL 5124. Prerequisite: BIOL 3863. (Typically offered: Fall)

BIOL 5133. Insect Molecular Genetics. 3 Hours.

A hands on course in insect molecular genetic techniques including molecular diagnostics and population genetics. Students will learn how to apply advanced molecular genetic methodologies and Internet database resources to insects that they are using for their graduate research. (Typically offered: Spring Even Years)
This course is cross-listed with ENTO 5133.

BIOL 5153. Practical Programming for Biologists. 3 Hours.

Hands-on instruction in the fundamentals of biological computing. Students learn how to set up a Unix work station, work from the command line, install software, build databases, and program in Python, a popular scripting language for biological applications. Most examples focus on the analysis of genomic data. (Typically offered: Spring)

BIOL 5163. Dynamic Models in Biology. 3 Hours.

(Formerly BIOL 4163.) Mathematical and computational techniques for developing, executing, and analyzing dynamic models arising in the biological sciences. Both discrete and continuous time models are studied. Applications include population dynamics, cellular dynamics, and the spread of infectious diseases. Graduate degree credit will not be given for both BIOL 4163 and BIOL 5163. Prerequisite: MATH 2554. (Typically offered: Irregular)

BIOL 5174. Conservation Genetics. 4 Hours.

Covers concepts of biodiversity identification and illustrates how genetic data are generated and analyzed to conserve and restore biological diversity. Corequisite: Lab component. Prerequisite: BIOL 3023, BIOL 3863 and STAT 2823 (or equivalent) and graduate standing. (Typically offered: Spring)

BIOL 5213. Biological Regulation and Subcellular Communication. 3 Hours.

Combines lectures, review of primary literature, student presentations, and small group discussions to explore a diversity of topics related to mechanisms of biological regulation and subcellular communication. Prerequisite: Graduate standing. (Typically offered: Irregular)

BIOL 5223. Bacterial Lifestyles. 3 Hours.

The course will introduce students to bacteria as prokaryotic organisms, different from eukaryotes such as plants and animals. Model microbial systems will be studied in more detail to identify unique strategies that bacteria employ to thrive in their respective environment, whether they are causing diseases or establishing beneficial interactions with animal or plants or coexisting with other microorganisms in diverse ecological environments. The course will also cover special adaptations that bacteria have evolved to adapt to harsh environments and how these adaptations can be harnessed to control pollution. Prerequisite: (BIOL 2013 and BIOL 2011L) or BIOL 3123. (Typically offered: Spring Odd Years)
This course is cross-listed with PLPA 5123.

BIOL 5233. Genomics and Bioinformatics. 3 Hours.

Principles of molecular and computational analyses of genomes. Prerequisite: BIOL 2533 or BIOL 2323. (Typically offered: Spring)

BIOL 5241L. Ichthyology Laboratory. 1 Hour.

Practical application of fish identification based on anatomy, fish sampling methods, and curation of fish specimen. Laboratory component of BIOL 5243. Corequisite: BIOL 5243. (Typically offered: Spring Odd Years)

BIOL 5243. Ichthyology. 3 Hours.

Comprehensive overview of the diversity of fishes. Covers anatomy, physiology, evolution, taxonomy, ecology, behavior, zoogeography and conservation of marine and freshwater fishes. Lecture 3 hours per week. Corequisite: BIOL 5241L. (Typically offered: Spring Odd Years)

BIOL 5254. Comparative Physiology. 4 Hours.

(Formerly BIOL 4234.) Comparison of fundamental physiological mechanisms in various animal groups. Adaptations to environmental factors at both the organismal and cellular levels are emphasized. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4234 and BIOL 5254. Prerequisite: BIOL 2533 and CHEM 3613 and (CHEM 3611L or CHEM 3612M). (Typically offered: Fall)

BIOL 5263. Cell Physiology. 3 Hours.

In-depth molecular coverage of cellular processes involved in growth, metabolism, transport, excitation, signaling and motility, with emphasis on function and regulation in eukaryotes, primarily animals. Prerequisite: BIOL 2323, BIOL 2533, BIOL 2531L, CHEM 3813, and PHYS 2033. (Typically offered: Fall)

BIOL 5273. Endocrinology. 3 Hours.

In endocrinology we study hormonal integration of living processes at all levels from molecule to organism. We will work with the mechanisms of hormone action, the endocrine control axes and hormones physiological role. The course will include paper discussions and student presentations on topics of special interest. (Typically offered: Spring)

BIOL 5303. Plant Physiology. 3 Hours.

Introductory course in plant physiology focusing on cellular processes that support the metabolic, developmental, and reproductive needs of plants. Prerequisite: 3 hours of cell biology or biochemistry. (Typically offered: Fall)

BIOL 5313. Molecular Cell Biology. 3 Hours.

In-depth molecular coverage of transcription, cell cycle, translation, and protein processing in eukaryotes and prokaryotes. Prerequisite: BIOL 2533 and BIOL 2323 and CHEM 3603 and CHEM 3601L and CHEM 3613 and CHEM 3611L. (Typically offered: Spring)

BIOL 5323. Comparative Neurobiology. 3 Hours.

Exploration of modern research approaches to understanding the development and function of animal nervous systems, with emphasis on molecular and cellular approaches in non-human animal models commonly used in biomedical research. Format combines lectures, group discussions, and student presentations using examples from the primary neurobiology literature. Prerequisite: Graduate standing. (Typically offered: Irregular)

BIOL 5343. Advanced Immunology. 3 Hours.

Aspects of innate, cell-mediated, and humoral immunity in mammalian and avian species. Molecular mechanisms underlying the function of the immune system are emphasized. A course in Basic Immunology prior to enrollment in Advanced Immunology is recommended but not required. Lecture 3 hours per week. (Typically offered: Spring)
This course is cross-listed with POSC 5343.

BIOL 5352L. Immunology in the Laboratory. 2 Hours.

Laboratory course on immune-diagnostic laboratory techniques and uses of antibodies as a research tool. Included are cell isolation and characterization procedures, immunochemistry, flow cytometry, ELISA and cell culture assay systems. Laboratory 6 hours per week. Prerequisite: POSC 5343 or BIOL 5343. (Typically offered: Spring)
This course is cross-listed with POSC 5352L.

BIOL 5353. Ecological Genetics/genomics. 3 Hours.

Analysis of the genetics of natural and laboratory populations with emphasis on the ecological bases of evolutionary change. Prerequisite: BIOL 2323 and BIOL 2321L, BIOL 3023 and MATH 2554 and STAT 2823 or equivalents. (Typically offered: Fall Odd Years)

BIOL 5404. Comparative Botany. 4 Hours.

A comparative approach to organisms classically considered to be plants with emphasis on morphology, life history, development, and phylogeny. Three hours lecture, 4 hours lab per week. Corequisite: Lab component. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

BIOL 5414. Mycology. 4 Hours.

Form and function of the fungi. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Laboratory component. (Typically offered: Irregular)

BIOL 5433. Principles of Evolution. 3 Hours.

Advanced survey of the mechanisms of evolutionary change with special emphasis on advances since the Modern Synthesis. Historical, theoretical, and population genetics approaches are discussed. Recommended: BIOL 3023 and BIOL 2321L and BIOL 3861L. Prerequisite: BIOL 2323 and BIOL 3863. (Typically offered: Fall Even Years)

BIOL 5463. Physiological Ecology. 3 Hours.

Interactions between environment, physiology, and properties of individuals and populations on both evolutionary and ecological scales. Prerequisite: BIOL 3863 and BIOL 4234. (Typically offered: Spring Odd Years)

BIOL 5511L. Population Ecology Laboratory. 1 Hour.

Demonstration of the models and concepts from BIOL 5513. Pre- or Corequisite: BIOL 5513. (Typically offered: Fall Even Years)

BIOL 5513. Population Ecology. 3 Hours.

Survey of theoretical and applied aspects of populations processes stressing models of growth, interspecific interactions, and adaptation to physical and biotic environments. Corequisite: BIOL 5511L. Prerequisite: BIOL 3863. (Typically offered: Fall Even Years)

BIOL 5523. Plant Ecology. 3 Hours.

To develop understanding of important ecological concepts through study of dynamics relationships among plants and their environment. To become familiar with the literature of plant ecology, and interpretation and critique of ecological research. Prerequisite: BIOL 3863. (Typically offered: Spring Even Years)

BIOL 5524. Developmental Biology with Laboratory. 4 Hours.

An analysis of the concepts and mechanisms of development emphasizing the experimental approach. Students may not receive degree credit for both BIOL 5543 Developmental Biology and BIOL 5524 Developmental Biology with Laboratory. Corequisite: Lab component. (Typically offered: Fall)

BIOL 5534. Biochemical Genetics. 4 Hours.

Lectures and laboratories based on modern molecular genetic techniques for analyses of eukaryotes and manipulation of prokaryotes. A hands-on course in recombinant DNA techniques: laboratory practices in gene identification, cloning, and characterization. Lecture 2 hours, laboratory 6 hours per week. Corequisite: Lab component. Prerequisite: BIOL 2323 (or equivalent) and CHEM 3813 (or equivalent). (Typically offered: Spring)

BIOL 5543. Developmental Biology. 3 Hours.

An analysis of the principles and mechanisms of development emphasizing the embryonic and postembryonic development of animals. Degree credit will not be allowed for both BIOL 5543 and BIOL 5524. (Typically offered: Irregular)

BIOL 5553. Astrobiology. 3 Hours.

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes the origin and evolution of life on Earth, possibility of life elsewhere in the solar system (including Mars), and the possibility of life on planets around other stars. Prerequisite: Instructor consent. (Typically offered: Irregular)
This course is cross-listed with SPAC 5553.

BIOL 5563. Cancer Biology. 3 Hours.

An introduction to the fundamentals of cancer biology. Prerequisite: BIOL 2533. (Typically offered: Fall)

BIOL 5613. Primate Adaptation and Evolution. 3 Hours.

(Formerly BIOL 4613.) Introduction to the biology of the order Primates. This course considers the comparative anatomy, behavioral ecology and paleontology of our nearest living relatives. Graduate degree credit will not be given for both BIOL 4613 and BIOL 5613. Prerequisite: BIOL 3023 or ANTH 1013. (Typically offered: Spring)
This course is cross-listed with ANTH 5623.

BIOL 5634. Wetlands Ecology and Management. 4 Hours.

To familiarize students with the ecology and management of wetlands. Students will be exposed to the characteristics of wetlands, the environmental factors that produce wetland types, and the management techniques used to meet desired wetland goals. Primary lecture topics will include: wetland definition, wetlands of the world, wetland status, trends, laws, wetland hydrology, wetland soils, wetland plants, wetland plant adaptations, wetland ecosystem development, and wetland management. Lecture 2 hours, Laboratory 3 hours per week. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5643. Eukaryote Phylogeny. 3 Hours.

Molecular analysis of the eukaryotic tree of life, phylogenetic tree reconstruction, and eukaryote diversity and evolutionary relationships. (Typically offered: Spring Odd Years)

BIOL 5693. Forest Ecology. 3 Hours.

(Formerly BIOL 4693.) Introduction to the various biological, ecological and historical aspects of forest communities, with particular emphasis on the forests of the central and southeastern United States. Graduate degree credit will not be given for both BIOL 4693 and BIOL 5693. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5703. Mechanisms of Pathogenesis. 3 Hours.

A survey of events causing human disease at the molecular, cellular and genetic levels. Seeks to develop an appreciation that both the tricks pathogens use and the body's own defenses contribute to pathology. (Typically offered: Fall)

BIOL 5711L. Basic Immunology Laboratory. 1 Hour.

(Formerly BIOL 4711L.) Basic immunology laboratory. Graduate degree credit will not be given for both BIOL 4711L and BIOL 5711L. Corequisite: BIOL 5713. (Typically offered: Spring)

BIOL 5713. Basic Immunology. 3 Hours.

A general overview of Immunity with emphasis on the underlying cellular, molecular and genetic events controlling immune reactions. Reading of the primary literature on disease states involving the immune system. (Typically offered: Spring)

BIOL 5723. Fish Biology. 3 Hours.

Morphology, classification, life histories, population dynamics, and natural history of fishes and fish-like vertebrates. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: 12 hours of biological sciences. (Typically offered: Spring Odd Years)

BIOL 5734. Protistology. 4 Hours.

The biology of eukaryotes other than animals, land plants, and fungi with emphasis on morphology and modern approaches to phylogenetic systematics. Three hours lecture, four hours lab/week. Involves writing term papers. Corequisite: Lab component. (Typically offered: Irregular)

BIOL 5743. Herpetology. 3 Hours.

Morphology, classification and ecology of amphibians and reptiles. Lecture 2 hours, laboratory 1 hour per week. Corequisite: Lab component. (Typically offered: Spring Even Years)

BIOL 5753. General Virology. 3 Hours.

An introduction to viral life-cycles, structure, and host cell interactions. Emphasis placed on molecular and biochemical aspects of virology. Two hour lecture and one hour discussion. Prerequisite: BIOL 2533 and BIOL 2323. (Typically offered: Spring)

BIOL 5763. Ornithology. 3 Hours.

Taxonomy, morphology, physiology, behavior, and ecology of birds. Lecture, laboratory, and field work. Corequisite: Lab component. Prerequisite: 10 hours of biological sciences. (Typically offered: Spring Even Years)

BIOL 5774. Biometry. 4 Hours.

(Formerly BIOL 4774.) Students learn biological statistics and experimental design by actually designing experiments and analyzing data, as well as through lecture, discussion, reading, writing, and problem solving. Lecture 3 hours, laboratory 3 hours each week. Graduate degree credit will not be given for both BIOL 4774 and BIOL 5774. Corequisite: Lab component. Prerequisite: STAT 2823 or equivalent, BIOL 3863. (Typically offered: Spring Even Years)

BIOL 5783. Mammalogy. 3 Hours.

Lectures and laboratory dealing with classification, morphology, distribution, ecology, behavior, and physiology of mammals. Two hours lecture, 4 hours laboratory. Corequisite: Lab component. (Typically offered: Fall)

BIOL 5793. Introduction to Neurobiology. 3 Hours.

(Formerly BIOL 4793.) Exploration of the neurological underpinnings of perception, action, and experience including: how sense receptors convert information in the world into electricity, how information flows through the nervous systems, how neural wiring makes vision possible, how the nervous system changes with experience, and how the system develops. Graduate degree credit will not be given for both BIOL 4793 and BIOL 5793. Prerequisite: BIOL 2533. (Typically offered: Spring)

BIOL 580V. Special Topics in Biological Sciences. 1-6 Hour.

Consideration of new areas of biological sciences not yet treated adequately in other courses. Prerequisite: 8 hours of biological sciences. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

BIOL 5833. Animal Behavior. 3 Hours.

Organization, regulation, and phylogeny of animal behavior, emphasizing vertebrates. Lecture, laboratory, and field work. Corequisite: Lab component. (Typically offered: Fall Odd Years)

BIOL 5843. Conservation Biology. 3 Hours.

The study of direct and indirect factors by which biodiversity is impacted by human activity. It is a synthetic field of study that incorporates principles of ecology, biogeography, population genetics, economics, sociology, anthropology, philosophy, geology, and geography. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5844. Community Ecology. 4 Hours.

Survey of theoretical and applied aspects of community processes stressing structure, trophic dynamics, community interactions, and major community types. Corequisite: Lab component. Prerequisite: BIOL 3863. (Typically offered: Fall Odd Years)

BIOL 5863. Analysis of Animal Populations. 3 Hours.

(Formerly BIOL 4863.) Basic principles of design and analysis for population studies of fish and wildlife species. Students will be instructed in the use of the latest software for estimating population parameters. Focus will be on both concepts and applications. Management applications of estimated parameters will be emphasized. Lecture 2 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4863 and BIOL 5863. Corequisite: Lab component. Prerequisite: BIOL 3863. (Typically offered: Spring Even Years)

BIOL 5873. Microbial Molecular Genetics and Informatics. 3 Hours.

Fundamentals of microbial genomics and bioinformatics. Course covers microbial genetics, genetic structure, genome organization, proteome organization, approaches for the analysis of DNA, RNA, and proteins, cellular metabolic pathways, genetic regulation, small RNA molecules, functional genomics, metagenomics, and bioinformatics approaches for analysis of microbial genomes. Prerequisite: Graduate status. (Typically offered: Fall)

BIOL 5883. Mammalian Evolution and Osteology. 3 Hours.

Focuses on describing the evolutionary history of mammals, a group of vertebrates that include over 5,000 species in 29 orders, and will provide an overview of living species and their identifying features. Credit will not be given for both ANTH 4703 and ANTH 5703. Prerequisite: Instructor consent. (Typically offered: Fall Even Years)

This course is cross-listed with ANTH 5703.

BIOL 5914. Stream Ecology. 4 Hours.

Current concepts and research in lotic ecosystem dynamics. Lecture, laboratory, field work and individual research projects required. Corequisite: Lab component. Prerequisite: 3 hours of ecology-related coursework. (Typically offered: Fall Even Years)

BIOL 5933. Global Biogeochemistry: Elemental Cycles and Environmental Change. 3 Hours.

This course explores the chemical, biological, and geological processes occurring within ecosystems. An understanding of these processes is used to investigate how they form the global biogeochemical cycles that provide energy and nutrients necessary for life. Class discussions focus on global change and the effects of more recent anthropogenic influences. Prerequisite: 3 hours of chemistry or biochemistry and ecology. (Typically offered: Spring Odd Years)

BIOL 596V. Culture and Environment: Field Studies. 1-6 Hour.

(Formerly BIOL 496V.) May be taken by students participating in overseas study programs or other domestic field study programs approved by the department. Graduate degree credit will not be given for both BIOL 496V and BIOL 596V. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

BIOL 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

BIOL 6113. Insect Physiology. 3 Hours.

General and comparative physiology of insects. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. (Typically offered: Spring Even Years) This course is cross-listed with ENTO 6113.

BIOL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Biological and Agricultural Engineering (BAEG)

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Biological and Agricultural Engineering Website (<http://bio-ag-engineering.uark.edu/>)

Degrees Conferred:

M.S.B.E. (BENG) in Biological Engineering

M.S.En.E. (ENEG) in Environmental Engineering, in collaboration with Civil Engineering (See Environmental Engineering (p. 142))
Ph.D. (BENG) in Engineering (See Engineering (p. 127))

Biological Engineering (BENG) (M.S.B.E.)

Primary Areas of Faculty Research: The biological and agricultural engineering program is unique in that it is linked administratively to the College of Engineering and the Division of Agriculture. At present, the department is experiencing growth in teaching, research and service. In particular, departmental research continues to strengthen and expand in its two broad areas:

Biotechnology Engineering – Biotechnology at the micro- and nano-scale, food processing, food safety and security, bio-energy, developing new products from biomaterials, biotransformation to synthesize industrial and pharmaceutical products, bioinstrumentation, bio-nano interfacing and molecular self-assembly, bio-nano plasmonics, and bio-nano sensing.

Ecological Engineering – Integrates ecological principles into the design of sustainable systems to treat, remediate, and prevent pollution to the environment. Applications include mathematical modeling of watershed process, stream restoration, watershed management, water and wastewater treatment design, ecological services management, urban greenway design and enclosed ecosystem design.

M.S.B.E. in Biological Engineering

Admission to the Degree Program: Admission to the Biological Engineering graduate program is a three-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School. Second, the student must be accepted into the department's program, which depends on transcripts, recommendations, a statement of purpose, and the following additional requirements:

Students with an ABET-accredited or equivalent Engineering Degree

- Students seeking admission to an M.S. program from a B.S. degree in engineering:
 1. A score on the Graduate Record Examination (GRE) (<http://www.gre.org/ed>) to meet the Graduate School requirement of a standardized exam.
 2. For students whose first language is not English, a demonstration of English-language proficiency which meets the requirements of the Graduate School.
 3. GPA of 3.00 or higher on the last 60 hours of a B.S. degree or B.S. and/or M.S. degrees.
 4. B.S. degree in engineering from an ABET accredited program or equivalent.

Students without an Engineering Degree

- Students to an M.S. program from a non-engineering B.S. degree:
 1. A score on the Graduate Record Examination (GRE) (<http://www.gre.org/ed>) to meet the Graduate School requirement of a standardized exam.
 2. For students whose first language is not English, a demonstration of English-language proficiency which meets the requirements of the Graduate School.

3. GPA of 3.00 or higher on the last 60 hours of a BS degree.
4. Completion of 18 hours of engineering course work.

Finally, a member of the faculty who is eligible (graduate status of group II or higher) must agree to serve as the major adviser to the prospective student.

Detailed requirements are in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at baeg.uark.edu (<http://baeg.uark.edu/>).

Requirements for the Master of Science Degree: (Minimum 30 hours)
In addition to the requirements of the Graduate School and the graduate faculty in Engineering, the following departmental requirements must be satisfied for the M.S.B.E. degree:

1. Students with an engineering B.S. degree: All students are required to complete not less than 24 semester hours of course work acceptable to the committee and a minimum of six semester hours of thesis. Of the 24 hours required for the M.S. degree, no more than 12 semester hours of course work presented for the MS degree can be at the 4000 level.
2. Students with a non-engineering B.S. degree: In addition to the requirement in 1, students must complete 18 hours of deficiency engineering course work to demonstrate engineering competence.
3. Earn a minimum cumulative grade-point average of 3.0 on all graduate courses attempted. The minimum acceptable grade on a graduate course is "C."
4. Prior to acceptance into the program a candidate must, in consultation with the department head, identify a professor who is willing to serve as the major professor. During the first semester, the candidate must, in consultation with the major professor and department head, select a graduate committee. The candidate will, in consultation with the committee, prepare a written graduate program of study that will achieve the candidate's objectives.
5. Satisfactorily pass a written thesis research proposal at least one semester before completing all other requirements. Students may retake a failed proposal defense once, contingent upon approval of the student's advisory committee. A student who fails the proposal defense twice will be terminated from the program.
6. Satisfactorily pass a final oral examination and complete and submit a thesis.
7. Candidates must prepare a paper suitable for submission to a refereed journal from research done for a thesis.

Detailed requirements are in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at bio-ag-engineering.uark.edu. (http://bio-ag-engineering.uark.edu/Academic/Graduate_Program/BAEG_Graduate_Handbook_May_2017BAEG.pdf)

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Engineering

Admission to the Degree Program: Admission to the Biological Engineering graduate program is a three-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School. Second, the student must be accepted into the department's program, which depends on transcripts, recommendations, a statement of purpose, and the following additional requirements:

Students with an ABET-accredited or equivalent Engineering Degree

- Students seeking admission to the Ph.D. program who have a B.S. and M.S. degree in engineering:
 1. A score on score of 301 or above (verbal and quantitative) on the Graduate Record Examination (GRE) (<http://www.gre.org/>) to meet the Graduate School requirement of a standardized exam. .
 2. A TOEFL score of at least 550 (paper-based) or 213 (computer-based) or 80 (Internet-based). For students This requirement is waived for applicants whose first native language is not English, English or who earn a demonstration of English-language proficiency which meets the requirements of the Graduate School. Bachelor's or Master's degree from a a U.S. institution.
 3. GPA of 3.00 or higher on the last 60 hours of a B.S. degree or B.S. and/or M.S. degrees.
 4. B.S. degree in engineering from an ABET-accredited program or equivalent.
- Students to a Ph.D. program directly from a B.S. degree in engineering:
 1. A score on the Graduate Record Examination (GRE) to meet the Graduate School requirement of a standardized exam.
 2. A score of 307 or above (verbal and quantitative) on the GRE.
 3. A TOEFL score of at least 550 (paper-based) or 213 (computer-based) or 80 (Internet-based).For students This requirement is waived for applicants whose first nati language is not English, English or who earn a demonstration of English-language proficiency which meets the requirements of the Graduate School.
 4. Bachelor's or master's degree from a U.S. institution.
 5. A cumulative GPA of 3.5 or above for undergraduate work.
 6. B.S. degree in engineering from an ABET-accredited program or equivalent.

Students without an Engineering Degree

- Students seeking admission to a Ph.D. program from non-engineering B.S. plus M.S. degrees:
 1. A score on the Graduate Record Examination (GRE) to meet the Graduate School requirement of a standardized exam.
 2. A score of 301 or above (verbal and quantitative) on the GRE.
 3. A TOEFL score of at least 550 (paper-based) or 213 (computer-based) or 80 (Internet-based). For students This requirement is waived for applicants whose first nati language is not English, English or who earn a demonstration of English-language proficiency which meets the requirements of the Graduate School.
 4. Bachelor's or master's degree from a U.S. institution.
 5. GPA of 3.00 or higher on the last 60 hours of B.S. and/or M.S. degrees.
 6. Completion of 18 hours of engineering course work.
- Students to a Ph.D. program directly from a non-engineering B.S. degree:
 1. A score on the Graduate Record Examination (GRE) to meet the Graduate School requirement of a standardized exam.

2. A score of 307 or above (verbal and quantitative) with 155 (quantitative) and 4.5 or above in writing on the GRE.
3. A TOEFL score of at least 580 (paper-based) or 237 (computer-based) or 92 (Internet-based). For students This requirement is waived for applicants whose first native language is not English, English or who earn a demonstration of English-language proficiency which meets the requirements of the Graduate School.
4. Bachelor's or master's degree from a U.S. institution.
5. A cumulative GPA of 3.5 or above for undergraduate work.
6. Completion of 18 hours of engineering course work.

Finally, a member of the faculty who is eligible (graduate status of group II or higher) must agree to serve as the major adviser to the prospective student.

Detailed requirements are in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at baeg.uark.edu (<http://baeg.uark.edu/>).

Requirements for the Doctor of Philosophy Degree: (Minimum 78 hours). In addition to the requirements of the Graduate School, the department follows the College of Engineering's requirements with an additional requirement:

1. Students entering directly with an engineering B.S. degree: All students must complete a minimum of 78 semester hours of graduate-level credit beyond the engineering bachelor's degree, including a minimum of 48 semester hours of course work and a minimum of 30 semester hours of dissertation research credits. Of the 78 hours required for the Ph.D. degree, up to 12 semester hours of 4000-level courses may be taken in the first 30 semester hours of course work. The remaining credits (minimum of 66 semester hours, 36 semester hours of coursework and 30 semester hours of dissertation) must be at the 5000 level or above.
2. Students entering with a master's degree: Upon recommendation of the student's advisory committee, a student who has entered the Ph.D. program after a master's degree may receive credit for up to 30 semester hours toward the required 78 credit hours. If the 30 hours includes master's thesis research, the advisory committee may credit up to 6 hours of thesis research toward the minimum dissertation research requirement. All subsequent coursework presented for the PhD degree must be at the 5000 level or above.
3. Students with a non-engineering B.S. degree: In addition to the requirements in 1 and 2 above, students must complete 18 hours of deficiency engineering course work to demonstrate engineering competence.
4. Complete a minimum of nine semester credit hours of coursework in a set of coherent courses in a related subject area approved by the student's advisory committee.
5. Earn a minimum cumulative grade-point average of 3.0 on all graduate courses attempted. The minimum acceptable grade on a graduate course is "C."
6. Satisfactorily pass a preliminary examination (Note that the Engineering College defines this examination as a qualifying examination). After completing the course requirements the prospective candidate must take the preliminary examination. Students may retake a failed preliminary exam once, contingent upon approval of the student's advisory committee. A student who fails the preliminary examination twice will be terminated from the program.
7. Satisfactorily pass a proposal defense. The prospective candidate must present the dissertation research proposal to the advisory

committee after completing the preliminary examination, and at least one year before completing all other requirements. Students may retake a failed proposal defense once, contingent upon approval of the student's advisory committee. A student who fails the proposal defense twice will be terminated from the program.

8. Satisfactorily pass a final comprehensive oral examination and complete and submit a dissertation.
9. Candidates must prepare a paper suitable for submission to a refereed journal from research done for a dissertation.

Detailed requirements are in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at bio-ag-engineering.uark.edu (http://bio-ag-engineering.uark.edu/Academic/Graduate_Program/BAEG_Graduate_Handbook_May_2017BAEG.pdf).

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Costello, Thomas A., Ph.D. (Louisiana State University), M.S.Ag.E., B.S.Ag.E. (University of Missouri-Columbia), Associate Professor, 1986.

Haggard, Brian Edward, Ph.D. (Oklahoma State University), M.S. (University of Arkansas), B.S. (Missouri University of Science and Technology), Professor, 2006.

Henry, Christopher Garrett, Ph.D. (University of Nebraska-Lincoln), M.S., B.S. (Kansas State University), Associate Professor, 2011.

Kim, Jin-Woo, Ph.D. (Texas A&M University), M.S. (University of Wisconsin-La Crosse), B.S. (University of Iowa), Professor, 2001.

Le, Kieu Ngoc, Ph.D. (North Carolina Agricultural and Technical State University), M.S. (North Carolina Agricultural and Technical State University), B.E., B.S. (Cantho University, Vietnam), Instructor, 2017.

Li, Yanbin, Ph.D. (Pennsylvania State University), M.S. (University of Nebraska-Lincoln), B.S. (Shenyang Agricultural University), Distinguished Professor, 1989.

Liang, Yi, Ph.D. (University of Alberta, Canada), M.S., B.S. (China Agricultural University, Beijing, China), Associate Professor, 2007.

Loewer, Otto J., Ph.D. (Purdue University), M.S. (Michigan State University), B.S. (Louisiana State University), Professor, 1996.

Matlock, Marty D., Ph.D., M.S., B.S. (Oklahoma State University), Professor, 2001.

Osborn, G. Scott, Ph.D. (North Carolina State University), M.S., Ag.E., B.S. (University of Kentucky), Associate Professor, 2001.

Runkle, Benjamin R.K., Ph.D., M.S. (University of California–Berkeley), B.S. (Princeton University), Assistant Professor, 2014.

Sadaka, Sammy, Ph.D. (Dalhousie University, Canada, and Alexandria University, Egypt), M.S., B.S. (Alexandria University, Egypt), Associate Professor, 2007.

VanDevender, Karl, Ph.D. (University of Arkansas), M.S., B.S. (Mississippi State University), Professor, 1995.

Verma, Lalit R., Ph.D. (University of Nebraska-Lincoln), M.S. (University of Montana), B. Tech. (J.N. Agricultural University, Jabalpur, India), Professor, 2000.

Zhu, Jun, Ph.D. (University of Illinois at Urbana-Champaign), M.S., B.S. (Zhejiang University, Hangzhou, China), Professor, 2013.

Courses

BENG 500V. Advanced Topics in Biological Engineering. 1-6 Hour.

Special problems in fundamental and applied research. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

BENG 5103. Advanced Instrumentation in Biological Engineering. 3 Hours.

Applications of advanced instrumentation in biological systems. Emphasis on updated sensing and transducing technologies, data acquisition and analytical instruments. Lecture 2 hours, lab 3 hours per week. Corequisite: Lab component. Prerequisite: BENG 3113. (Typically offered: Spring Even Years)

BENG 5253. Bio-Mems. 3 Hours.

Topics include the fundamental principles of microfluidics, Navier-Stokes Equation, bio/abio interfacing technology, bio/abio hybrid integration of microfabrication technology, and various biomedical and biological problems that can be addressed with microfabrication technology and the engineering challenges associated with it. Lecture 3 hour per week. Prerequisite: MEEG 3503 or CVEG 3213 or CHEG 2133. (Typically offered: Irregular)

This course is cross-listed with MEEG 5253.

BENG 5613. Simulation Modeling of Biological Systems. 3 Hours.

Application of computer modeling and simulation of discrete-event and continuous-time systems to solve biological and agricultural engineering problems. Philosophy and ethics of representing complex processes in simplified form. Deterministic and stochastic modeling of complex systems, algorithm development, application limits, and simulation interpretation. Emphasis on calibration, validation and testing of biological systems models for the purposes of system optimization, resource allocation, real-time control and/or conceptual understanding. Prerequisite: AGST 5023 or (STAT 3003 or STAT 5003) or INEG 2313. (Typically offered: Irregular)

BENG 5623. Life Cycle Assessment. 3 Hours.

This course will examine the process and methodologies associated with life cycle analysis (LCA). The course will explore the quantitatively rigorous methodology for life cycle inventory (LCI), LCA and life cycle impact assessment (LCIA). This course is offered on-line. The principal instructor will be a UA faculty member. (Typically offered: Spring)

BENG 5633. Linkages Among Technology, Economics and Societal Values. 3 Hours.

Addresses how macro-level change is influenced by the linkages among technology, economics and societal values. Three major course initiatives: 1) Developing a conceptual model for understanding how macro-level change has occurred over history; 2) Examining recorded history in order to develop a contextual appreciation for Society's current situation; and 3) Using statistical data to identify six overriding world trends that are likely to greatly impact society's goal of achieving sustainable prosperity and well-being in the foreseeable future. Prerequisite: Graduate standing or instructor permission. (Typically offered: Fall and Spring)

This course is cross-listed with OMG 5633.

BENG 5703. Design and Analysis of Experiments for Engineering Research. 3 Hours.

Principles of planning and design of experiments for engineering research. Propagation of experimental error. Improving precision of experiments. Analysis of experimental data for optimal design and control of engineering systems using computer techniques. Students must have an introductory background in statistics. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. (Typically offered: Irregular)

BENG 5801. Graduate Seminar. 1 Hour.

Reports presented by graduate students on topics dealing with current research in biological engineering. Prerequisite: Graduate standing. (Typically offered: Spring)

BENG 5923. Nonpoint Source Pollution Control and Modeling. 3 Hours.

Control of hydrologic, meteorologic, and land use factors on nonpoint source (NPS) pollution in urban and agricultural watersheds. Discussion of water quality models to develop NPS pollution control plans and total maximum daily loads (TMDLs), with consideration of model calibration, validation, and uncertainty analysis. Prerequisite: CVEG 3223. (Typically offered: Irregular)

BENG 5933. Environmental and Ecological Risk Assessment. 3 Hours.

Process and methodologies associated with human-environmental and ecological risk assessments. Environmental risk assessments based on human receptors as endpoints, addressing predominantly abiotic processes. Ecological risk assessments based on non-human receptors as endpoints. Approach using hazard definition, effects assessment, risk estimation, and risk management. Application of methods to student projects to gain experience in defining and quantifying uncertainty associated with human perturbation, management and restoration of environmental and ecological processes. (Typically offered: Spring)

BENG 5963. Modeling Environmental Biophysics. 3 Hours.

Interactions between the biosphere and the atmosphere. Connecting the physical environment of solar energy, wind, soil, and hydrology to the biosphere through plant ecophysiology. Boundary layer meteorology, photosynthesis and boundary layer modeling strategies, and the soil-plant-atmosphere continuum. Instrumentation, measurement and modeling strategies for understanding leaf-, landscape- and regional behaviors; and, the transfer, kinetics, and balance of momentum, energy, water vapor, CO₂, and other atmospheric trace gases between the landscape (vegetation and soil) and the atmosphere. Applications in sustainable agriculture, irrigation, land and water resources, and modeling plant water use and carbon uptake strategies. A working knowledge of calculus and a discipline related to the course is expected. Three hours of lecture per week. Students may not earn degree credit for both BENG 4963 and BENG 5963. Prerequisite: Instructor consent. (Typically offered: Spring Even Years)

BENG 5973. Advanced Practice in Water Quality Monitoring and Analysis. 3 Hours.

Application of water quality principles to a real world problem. Team project experience leading and developing quality assurance project plans, designing monitoring systems, selecting chemical analysis methods, estimating loads, performing trend analysis, basic model calibration and validation, team management, and technical report writing and oral presentations. Working with various clientele to analyze water quality data in the context of evaluating real-world problems and issues. Three hours of lecture per week. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

BENG 600V. Master's Thesis. 1-6 Hour.

Graduate standing required for enrollment. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

BENG 700V. Doctoral Dissertation. 1-18 Hour.

Candidacy is required for enrollment. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Biomedical Engineering (BMEG)

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Biomedical Engineering Website (<https://biomedical-engineering.uark.edu/>)

Degrees Conferred:

M.S.B.M.E. (BMEG)

Ph.D. (BMEG) in Engineering (See Engineering (p. 127))

Primary Areas of Faculty Research: Bioimaging and biosensing; bioinformatics and computational biology; tissue engineering and biomaterials; bio-MEMS/nanotechnology.

Program Objectives: The objectives of the M.S.B.M.E. program are to prepare graduates for careers in biomedical engineering practice with government agencies, engineering firms, consulting firms or industries and to provide a foundation for continued study at the post-master's level.

M.S.B.M.E. in Biomedical Engineering

Admission to Degree Program: Admission to the M.S.B.M.E. is a two-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School (see 'The Graduate School: Objectives, Regulations, Degrees' in this catalog or visit grad.uark.edu (<http://grad.uark.edu/>) for details). Second, the student must be admitted to the Department of Biomedical Engineering on the basis of academic transcripts, standardized test scores, three letters of recommendation and a statement of purpose. Students with a non-engineering degree or a non-ABET-accredited engineering degree must demonstrate completion of the Minimum Admission Criteria for non-Engineering Majors prior to being admitted. Complete details for admission may be obtained in the applicable program section from the Biomedical Engineering website (<http://bmeq.uark.edu/>) as well as in the BMEG graduate program handbook. A general summary of admission requirements is given below:

1. A B.S. or M.S. degree in engineering or engineering equivalent or completion of the minimum admission criteria for non-engineering majors (see below) with a GPA of at least 3.0.
2. A GPA of 3.0 or higher on the last 60 hours of the baccalaureate degree.
3. A GRE score of 302 or above (verbal and quantitative).
4. A TOEFL score of at least 213 (computer-based) or 80 (internet based). This requirement is waived for applicants whose native language is English or who earn a bachelor's or master's degree from a U.S. institution.
5. A member of the faculty who is eligible (graduate status of group III or higher) must agree to serve as the Major Adviser to the prospective student.

Minimum Admission Criteria for non-Engineering Majors: Prior to gaining admission into the M.S.B.M.E. program, students with a non-engineering degree or a non-ABET-accredited engineering degree must demonstrate completion of the following coursework with a GPA of at least 3.0: 3 courses in Mathematics (selected from Calculus I, Calculus II, Calculus III, Linear Algebra, and/or Differential Equations), 2 courses of university-level Biology, 2 courses of university-level Chemistry, and 2 courses of university-level (calculus-based) Physics. In addition, students will be required to enroll and complete one of the following courses to provide adequate background in Engineering Design (BMEG 2904 Biomedical Instrumentation, BMEG 3634 Biomaterials, BMEG 3124 Biomedical Signals and Systems, or BMEG 3824 Biomolecular Engineering). Students should consult the Graduate Coordinator for a complete list of courses that satisfy the Minimum Admission Criteria.

Complete details for admission may be obtained in the applicable program section from the B (<http://bmeq.uark.edu/>) Biomedical Engineering (<http://bmeq.uark.edu/>) website (<http://bmeq.uark.edu/>) as well as in the BMEG graduate program handbook.

Requirements for M.S. Degree in Biomedical Engineering: Both thesis and non-thesis options are available for the M.S.B.M.E. degree. In

general, students pursuing the thesis option are supported by research or teaching assistantships and conduct research under the guidance of a major adviser. Students pursuing the non-thesis options are typically not sponsored. For either option, all course work must be approved by the student's program advisory committee. The cumulative grade-point average on all graduate courses presented for the degree must be at least 3.0. A general summary of degree requirements is given below. More detailed information may be obtained from the B (<http://bmeg.uark.edu/>)iomedical Engineering (<http://bmeg.uark.edu/>) website (<http://bmeg.uark.edu/>) as well as in the BMEG graduate program handbook. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

- **Biomedical Engineering Thesis Option:** 24 hours of graduate-level course work, including 5 hours of Biomedical Engineering Graduate Core as identified below, at least 10 additional hours of graduate-level classes in Biomedical Engineering, and 6 hours of research resulting in a written master's thesis. Candidates must pass a comprehensive final examination that will include an oral defense of the master's thesis. The examination is prepared and administered by the student's master's thesis committee. All coursework must be at the 5000 level or above unless a request has been approved to use 4000-level courses for graduate credit.
- **Biomedical Engineering Non-thesis Option:** 30 hours of graduate-level course work including 5 hours of Biomedical Engineering Graduate Core as identified below, at least 10 additional hours of graduate-level classes in Biomedical Engineering. Candidates must pass a comprehensive written final examination. The examination is prepared and administered by the student's Program Advisory Committee. All coursework must be at the 5000 level or above unless a request has been approved to use 4000-level courses for graduate credit.

Biomedical Engineering Graduate Core

BMEG 5103	Design and Analysis of Experiments in Biomedical Research	3
BMEG 5801	Graduate Seminar I	1
BMEG 5811	Graduate Seminar II	1

Requirements for M.S.B.M.E. in Biomedical Engineering with Healthcare Entrepreneurship Concentration

Admission to Degree Program: Admission to the M.S.B.M.E. is a two-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School (see 'The Graduate School: Objectives, Regulations, Degrees' in this catalog or visit grad.uark.edu (<http://grad.uark.edu/>) for details). Second, the student must be admitted to the Department of Biomedical Engineering on the basis of academic transcripts, standardized test scores, three letters of recommendation and a statement of purpose. Students with a non-engineering degree or a non-ABET-accredited engineering degree must demonstrate completion of the Minimum Admission Criteria for non-Engineering Majors prior to being admitted. Complete details for admission may be obtained in the applicable program section from the Biomedical Engineering website (<http://bmeg.uark.edu/>) as well as in the BMEG graduate program handbook. A general summary of admission requirements is given below:

1. A B.S. or M.S. degree in engineering or engineering equivalent or completion of the minimum admission criteria for non-engineering majors (see below) with a GPA of at least 3.0.
2. A GPA of 3.0 or higher on the last 60 hours of the baccalaureate degree.
3. A GRE score of 302 or above (verbal and quantitative).
4. A TOEFL score of at least 213 (computer-based) or 80 (internet based). This requirement is waived for applicants whose native language is English or who earn a bachelor's or master's degree from a U.S. institution.
5. A member of the faculty who is eligible (graduate status of group III or higher) must agree to serve as the Major Adviser to the prospective student.

Minimum Admission Criteria for non-Engineering Majors: Prior to gaining admission into the M.S.B.M.E. program, students with a non-engineering degree or a non-ABET-accredited engineering degree must demonstrate completion of the following coursework with a GPA of at least 3.0: 3 courses in Mathematics (selected from Calculus I, Calculus II, Calculus III, Linear Algebra, and/or Differential Equations), 2 courses of university-level Biology, 2 courses of university-level Chemistry, and 2 courses of university-level (calculus-based) Physics. In addition, students will be required to enroll and complete one of the following courses to provide adequate background in Engineering Design (BMEG 2904 Biomedical Instrumentation, BMEG 3634 Biomaterials, BMEG 3124 Biomedical Signals and Systems, or BMEG 3824 Biomolecular Engineering. Students should consult the Graduate Coordinator for a complete list of courses that satisfy the Minimum Admission Criteria.

Complete details for admission may be obtained in the applicable program section from the B (<http://bmeg.uark.edu/>)iomedical Engineering (<http://bmeg.uark.edu/>) website (<http://bmeg.uark.edu/>) as well as in the BMEG graduate program handbook.

Requirements for M.S. Degree in Biomedical Engineering: Both thesis and non-thesis options are available for the M.S.B.M.E. degree. In general, students pursuing the thesis option are supported by research or teaching assistantships and conduct research under the guidance of a major adviser. Students pursuing the non-thesis options are typically not sponsored. For either option, all course work must be approved by the student's program advisory committee. The cumulative grade-point average on all graduate courses presented for the degree must be at least 3.0. A general summary of degree requirements is given below. More detailed information may be obtained from the B (<http://bmeg.uark.edu/>)iomedical Engineering (<http://bmeg.uark.edu/>) website (<http://bmeg.uark.edu/>) as well as in the BMEG graduate program handbook. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

- **Biomedical Engineering Thesis Option:** 24 hours of graduate-level course work, including 5 hours of Biomedical Engineering Graduate Core as identified below, at least 10 additional hours of graduate-level classes in Biomedical Engineering, and 6 hours of research resulting in a written master's thesis. Candidates must pass a comprehensive final examination that will include an oral defense of the master's thesis. The examination is prepared and administered by the student's master's thesis committee. All coursework must be at the 5000 level or above unless a request has been approved to use 4000-level courses for graduate credit.
- **Biomedical Engineering Non-thesis Option:** 30 hours of graduate-level course work including 5 hours of Biomedical Engineering Graduate Core as identified below, at least 10 additional hours of

graduate-level classes in Biomedical Engineering. Candidates must pass a comprehensive written final examination. The examination is prepared and administered by the student's Program Advisory Committee. All coursework must be at the 5000 level or above unless a request has been approved to use 4000-level courses for graduate credit.

Biomedical Engineering Graduate Core

BMEG 5103	Design and Analysis of Experiments in Biomedical Research	3
BMEG 5801	Graduate Seminar I	1
BMEG 5811	Graduate Seminar II	1

Healthcare Entrepreneurship Concentration

The Healthcare Entrepreneurship Concentration requires 15 additional hours of required courses and 10 additional hours of graduate-level classes in Biomedical Engineering. Candidates must pass a comprehensive written final examination. The examination is prepared and administered by the student's Program Advisory Committee. All coursework must be at the 5000 level or above unless a request has been approved to use 4000-level courses for graduate credit.

Business and Management Fundamentals

MGMT 5213	Business Foundations for Entrepreneurs	3
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New Venture Development

The following courses have to be taken in one continuous block

MGMT 5323	New Venture Development	3
MGMT 5313	Strategic Management	3
MGMT 5413	New Venture Development II	3

Public Health Fundamentals

Choose at least one course from below or another relevant course with Program Advisory Committee approval

PBHL 5213	Evaluation of Public Health Programs	3
PBHL 5533	Theories of Social and Behavioral Determinants of Health	3
PBHL 5563	Public Health: Practices and Planning	3

Graduate-level Electives 10

Ph.D. in Engineering

Program Description: The Ph.D. Degree in Engineering with a concentration in Biomedical Engineering is an interdisciplinary research degree awarded through the College of Engineering in cooperation with the Graduate School (at the University of Arkansas, there is a common Ph.D. degree for all engineering disciplines). The Ph.D. degree is earned through advanced coursework and in-depth, specialized research. Graduates from this program will be well-prepared for careers in academia, industry or government or as entrepreneurs in technology-based start-up companies.

Admission to Degree Program: Admission into the Ph.D. program with a concentration in Biomedical Engineering is a two-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School (see 'The Graduate School: Objectives, Regulations, Degrees' in this catalog or visit grad.uark.edu (<http://grad.uark.edu/>) for details). Second, the student must be admitted to the Department of Biomedical Engineering on the basis of academic transcripts, standardized test scores, three letters of recommendation, and statement of purpose. All students in the Ph.D. program are offered

either a research or teaching assistantship. A member of the faculty who is eligible (graduate faculty status of Group I), must agree to serve as the major adviser to the prospective student. Because of the multidisciplinary nature of Biomedical Engineering, students holding either Engineering or non-Engineering degrees are eligible to apply. Eligibility criteria are outlined below:

- **Engineering Academic Background:** Students with a B.S. or M.S. degree in engineering or engineering equivalent are eligible to apply for the Ph.D. program.
- **Non-engineering Academic Background:** Students with a non-engineering degree must fulfill the admission requirements for the Master of Science in Biomedical Engineering (M.S.B.M.E.) including the Minimum Admission Criteria for non-Engineering Majors (see admission requirements for the M.S.B.M.E.). Students with a non-engineering background may be admitted directly into the Ph.D. program; however, it is recommended that students first complete the M.S.B.M.E. degree before entering the Ph.D. program.

Complete details for admission may be obtained in the applicable section from the B (<http://bmeg.uark.edu>) Biomedical Engineering (<http://bmeg.uark.edu/>) website (<http://bmeg.uark.edu>) as well as in the BMEG graduate program handbook.

Degree Requirements for the Doctor of Philosophy in Engineering with a concentration in Biomedical Engineering: In addition to the requirements of the Graduate School and the College of Engineering, candidates must meet the following requirements:

1. Develop a Plan of Study within the first year after matriculation.
2. Complete an Annual Progress Report for each subsequent year of study.
3. Complete at least 42 hours of course work beyond the B.S. degree.
 - a. For B.S. to Ph.D. candidates, a minimum of 50 percent of the first 30 hours, and all of the remaining hours of course work, must be at the 5000 level or above.
 - b. For M.S. to Ph.D. candidates, all course work must be at the 5000 level or above.
4. The cumulative grade-point average on all graduate courses presented for the degree must be at least 3.0. Upon recommendation of the student's Program Advisory Committee, a student who has entered the Ph.D. program after an M.S. degree in engineering may receive credit for up to 24 hours of course work. See Coursework Requirements, below, for additional details.
5. Complete 30 hours of dissertation. Upon recommendation of the student's Program Advisory Committee, a student who has entered the Ph.D. program after an M.S. degree in engineering may receive credit for up to six hours of thesis research toward the dissertation requirement.
6. Satisfactorily pass both a written and oral candidacy examination administered by the student's Program Advisory Committee. Details of the candidacy exam are found in the BMEG graduate program handbook.
7. Assist in departmental teaching for two semesters.
8. Submit and defend the final dissertation to the student's Dissertation Committee.

Coursework Requirements: Students are required to complete 42 credit hours of coursework beyond the B.S. degree in engineering or equivalent in the following four categories.

Biomedical Engineering Graduate Core (5 hours)		5
BMEG 5103	Design and Analysis of Experiments in Biomedical Research	
BMEG 5801	Graduate Seminar I	
BMEG 5811	Graduate Seminar II	

Life Science – minimum of six hours approved by the student's Program Advisory Committee

Engineering Electives – minimum of nine hours approved by the student's Program Advisory Committee

BMEG Electives – minimum of six hours of graduate-level classes in Biomedical Engineering approved by the student's Program Advisory Committee

Detailed degree requirements may be obtained in the applicable program section from the B (<http://bmeg.uark.edu>) Biomedical Engineering (<http://bmeg.uark.edu/>) website (<http://bmeg.uark.edu>) as well as in the Biomedical Engineering graduate program handbook.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Balachandran, Kartik, Ph.D., M.S. (Georgia Institute of Technology), B.S. (National University of Singapore), Associate Professor, 2012.

Elsaadany, Mostafa, Ph.D. (University of Toledo), Teaching Assistant Professor, 2019.

Jensen, Hanna Katariina, Ph.D. (University of Oulu, Finland), Research Assistant Professor, 2015.

Jensen, Morten O., Ph.D. (University of Aarhus, Denmark), M.Sc. (Georgia Institute of Technology), Associate Professor, 2014.

Kim, Myunghee Michelle, Ph.D., B.S. (University of Texas at Austin), Clinical Assistant Professor, 2013.

Muldoon, Timothy J., M.D. (Baylor College of Medicine), Ph.D. (Rice University), B.S. (Johns Hopkins University), Associate Professor, 2012.

Nelson, Christopher, Ph.D. (Vanderbilt University), Assistant Professor, 2019.

Puvanakrishnan, Priyaveena, Ph.D. (University of Texas at Austin), Instructor, 2015.

Qian, Xianghong, Ph.D., M.Phil. (George Washington University), B.S. (Nanjing University, P.R. China), Professor, 2011.

Quinn, Kyle P., Ph.D. (University of Pennsylvania), B.S. (University of Wisconsin), Assistant Professor, 2014.

Rajaram, Narasimhan, Ph.D. (University of Texas, Austin), B.E. (Anna University, India), Assistant Professor, 2014.

Rao, Raj R., Ph.D. (University of Georgia), M.S. (University of Texas), M.Sc., B.E. (Birla Institute of Technology and Sciences, India), Professor, 2016.

Song, Young Hye, Ph.D. (Cornell University), Assistant Professor, 2019.

Wolchok, Jeffrey Collins, Ph.D. (University of Utah), M.S., B.S. (University of California at Davis), Associate Professor, 2011.

Courses

BMEG 5103. Design and Analysis of Experiments in Biomedical Research. 3 Hours.

An advanced course covering sample size estimation with power calculations, protection of vertebrate animals and human subjects, factorial design, multivariate analysis of variance, parametric and non-parametric data analysis, Kaplan-meier analysis, and post-test correction of multiple comparisons as related to biomedical data. Prerequisite: MATH 2584 and BMEG 3653 or equivalents. (Typically offered: Irregular)

BMEG 5203. Mathematical Modeling of Physiological Systems. 3 Hours.

Application of numerical methods and mathematical techniques to physiological systems. Cellular physiology topics include models of cellular metabolism, diffusion, membrane potential, excitability, calcium dynamics and intercellular signalling. Cardiovascular system topics include models of blood cells, oxygen transport, cardiac output, cardiac regulation, and circulation. Other physiology topics include respiration, muscle, vision, hearing, voice, and speech. Prerequisite: MATH 2584 or BMEG 3653 or BMEG 4623 or equivalents. (Typically offered: Irregular)

BMEG 5213. Tissue Mechanics. 3 Hours.

The purpose of this course is to introduce students to non-linear biomechanics of soft tissues such as skin, bladder, blood vessels, and the brain. Topics covered: Tissue mechanics: continuum biomechanics, tensor analysis, kinematics of continua, balance laws. Governing physics of mechanics as applied to soft tissues. Various constitutive relations will be discussed: linear elastic, hyperelastic, viscoelastic, poroelastic, and inelastic materials with internal variables. Cannot receive credit for both BMEG 4213 and BMEG 5213. Prerequisite: BMEG 2813 and BMEG 4623 or equivalents. (Typically offered: Irregular)

BMEG 5313. Advanced Biomaterials and Biocompatibility. 3 Hours.

From Absorbable sutures to Zirconium alloy hip implants, biomaterials science influences nearly every aspect of medicine. This course focuses on the study of different classes of biomaterials and their interactions with human tissues. Prerequisite: BMEG 3634 and BMEG 4623 or equivalents. (Typically offered: Irregular)

BMEG 5423. Regenerative Medicine. 3 Hours.

The course covers five broad areas: Biological and molecular basis for regenerative medicine, tissue development, regenerative medicine and innovative technologies, clinical applications of regenerative medicine, and regulation and ethics. Prerequisite: BIOL 2533 and BMEG 3824 or equivalents. (Typically offered: Irregular)

BMEG 5513. Biomedical Optics and Imaging. 3 Hours.

This course will provide students with a fundamental understanding of various biomedical imaging modalities. Topics will include: Basics of light-tissue interaction - absorption, fluorescence, elastic and inelastic scattering; Computational and analytical models of light propagation to quantify tissue optical properties; Optical imaging techniques - spectroscopy, tomography, and laser speckle with potential clinical applications; and Clinical imaging modalities and recent advances - X-ray, Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), Computed Tomography (CT), Ultrasound imaging, and Photoacoustic imaging. At the end of this course, students should have a good understanding of optical imaging, spectroscopy, and non-optical imaging modalities, specific anatomical sites that they are best suited for, and the trade-offs between imaging depth and resolution. Students may not receive credit for both BMEG 4513 and BMEG 5513. (Typically offered: Irregular)

BMEG 5523. Biomedical Data and Image Analysis. 3 Hours.

This course focuses on an introduction to image processing and analysis for applications in biomedical research. After a review of basic MATLAB usage, students will learn fundamental tools for processing and analyzing data from a variety of subdisciplines within biomedical engineering. Topics include: filtering, thresholding, segmentation, morphological processing, and image registration. Through exercises involving 1D, 2D, and 3D data, students will develop problem-solving skills and a knowledge base in MATLAB required for customized quantitative data analysis. Students may not receive credit for both BMEG 4523 and BMEG 5523. Prerequisite: Graduate standing. (Typically offered: Irregular)

BMEG 560V. Advanced Individual Study. 1-6 Hour.

Individual study and research of a topic mutually agreeable to the student and faculty member. Prerequisite: Graduate standing. (Typically offered: Irregular)

BMEG 570V. Advanced Special Topics. 1-6 Hour.

Consideration of current biomedical engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 15 hours of degree credit.

BMEG 5713. Cardiovascular Physiology and Devices. 3 Hours.

Understanding etymology of disease while creating solutions and dedicated devices is the primary focus of biomedical engineering. This course describes an interdisciplinary approach of the clinical and engineering worlds to develop devices for treating cardiovascular disease. The first part of the course will be a thorough review of the relevant anatomic and physiological considerations important for developing devices. Understanding these considerations from an engineering perspective to inform device development will be the second part of the course. Students may not receive credit for both BMEG 4713 and BMEG 5713. Prerequisite: Graduate standing. (Typically offered: Irregular)

BMEG 5800. Graduate Seminar I. 0 Hours.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including research ethics, authorship, biosafety and the use of animals in biomedical research. Prerequisite: BMEG 5801. (Typically offered: Fall) May be repeated for up to 0 hours of degree credit.

BMEG 5801. Graduate Seminar I. 1 Hour.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including research ethics, authorship, biosafety and the use of animals in biomedical research. (Typically offered: Fall) May be repeated for up to 2 hours of degree credit.

BMEG 5810. Graduate Seminar II. 0 Hours.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including professional development, career options, effective communication, technology transfer, clinical translation and intellectual property. Prerequisite: BMEG 5811. (Typically offered: Spring) May be repeated for up to 0 hours of degree credit.

BMEG 5811. Graduate Seminar II. 1 Hour.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including professional development, career options, effective communication, technology transfer, clinical translation and intellectual property. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

BMEG 5953. Fundamentals of Fracture and Fatigue in Structures. 3 Hours.

The course will cover the concepts of linear-elastic, elastic-plastic and time-dependent Fracture Mechanics as applied to fracture in a variety of materials, structures, and operating conditions. The examples will include fracture in large components such as aircraft, bridges and pressure vessels and also in bones and in soft materials and human tissue. Prerequisite: Graduate standing in Civil, Mechanical or Biomedical Engineering or consent of the instructor. (Typically offered: Fall and Spring)

This course is cross-listed with MEEG 5953, CVEG 5953.

BMEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

BMEG 700V. Doctoral Dissertation. 1-6 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

Career and Technical Education (CATE)

Ed Bengtson
Department Head, Curriculum and Instruction
216 Peabody Hall

479-575-4209

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Program Coordinator

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Career and Technical Education Program Page (<http://cate.uark.edu/masters/>)

See Curriculum and Instruction (p. 98) for full departmental faculty listing.

Degrees Conferred:

M.Ed. in Career and Technical Education (CATE)

Program Description: The degree of Master of Education in Career and Technical Education is available for students who possess a bachelor's degree in business, family and consumer sciences, or technology education or a related field in any of those areas. Candidates may choose one of two options. Option 1 is designed for the candidate who has a bachelor's degree in a related field in career and technical education and is interested in obtaining Arkansas teacher licensure. Option 2 is designed to meet the needs of current professionals in the field who desire to attain further education and an advanced degree in career and technical education.

Primary Areas of Faculty Research: Business technology, family and consumer sciences education, technology education, and STEM.

M.Ed. in Career and Technical Education

Admission to the Master of Education Degree : For acceptance to the master's degree program in career and technical education, the candidate must meet all general requirements of the Graduate School, an undergraduate program in career and technical education (business education, family and consumer science education, technology education) or in a related field. Additional prerequisites prescribed by the program area are: passing scores for Praxis I and Praxis II: Content and a successful interview by CATE faculty.

Requirements for the Master of Education Degree: (Minimum 33 hours)

Candidates for the master's degree in career and technical education must complete nine hours of core courses and 24 hours of professional education courses. In addition to the program requirements listed below, all degree candidates must successfully complete a written comprehensive examination.

Required Core Courses		9
Choose one course from the following:		3
ESRM 5013	Research Methods in Education	
ESRM 5393	Statistics in Education and Health Professions	
Choose one course from the following:		3
EDFD 5373	Psychological Foundations of Teaching and Learning	
EDFD 5573	Life-Span Human Development	
Choose one from the following:		3
CIED 5943	Teaching People of Other Cultures	

ETEC 5303	Teaching with Technology in the K-12 Classroom	
Required Professional Education Courses		24
Option 1:		
CATE 5003	Introduction to Professionalism	
CATE 5023	Classroom Management	
CATE 5013	Teaching Strategies	
CATE 5016	Cohort Teaching Internship	
CATE 5033	Assessment/Program Evaluation	
Option 2		
CATE 5543	Technology for Teaching and Learning	
Six semester hours selected with adviser's consent		6
Three semester hours of other professional education courses		3

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Graduate Faculty

Carter, Vinson R., Ph.D., M.A.T., B.S. (University of Arkansas), Associate Professor, Department of Curriculum and Instruction, 2008.

Daugherty, Michael, Ed.D., M.S., B.S. (Oklahoma State University), Professor, Department of Curriculum and Instruction, 2005.

Orr, Betsy, Ed.D., M.Ed. (University of Arkansas), B.A. (University of Arkansas at Monticello), Associate Professor, Department of Curriculum and Instruction, 1989.

Courses

CATE 5003. Introduction to Professionalism. 3 Hours.

This course examines the principles and concepts of professionalism in the teaching profession, with an emphasis on developing professional concepts in the profession. Added emphasis is on career and technical education organizations. Prerequisite: Admission to the CATE teacher education program. (Typically offered: Fall)

CATE 5013. Teaching Strategies. 3 Hours.

This course is designed to offer a variety of ideas and experiences concerning methods of teaching, planning and presenting instruction. (Typically offered: Fall)

CATE 5016. Cohort Teaching Internship. 6 Hours.

A minimum of 12 weeks will be spent in an off-campus school, at which time the intern will have an opportunity under supervision to observe, to teach, and to participate in other activities involving the school and the community. Prerequisite: Admission to the College of Education and Health Professions Teacher Education and CATE Master's program. (Typically offered: Spring)

CATE 5023. Classroom Management. 3 Hours.

(Formerly CATE 4023.) Theory and techniques in classroom management, including professional ethics and school policies related to students, faculty and programs. Graduate degree credit will not be given for both CATE 4023 and CATE 5023. Prerequisite: CATE 3103. (Typically offered: Fall)

CATE 5033. Assessment/Program Evaluation. 3 Hours.

An introduction to constructing, evaluating, and interpreting tests; descriptive and inferential statistics; state competency testing; and guidelines for state program evaluations. Prerequisite: Graduate standing. (Typically offered: Fall)

CATE 5073. Introduction to Teaching Programming in the Secondary Schools. 3 Hours.

(Formerly CATE 4073.) This course provides an introduction to the foundations of teaching methods for computer programming in the secondary schools. Methods of computer programming instruction will include teaching strategies in coding, developing computational thinking, problem-solving skills, and applying key programming concepts. This is an introductory level course. No prerequisites are required. Graduate degree credit will not be given for both CATE 4073 and CATE 5073. Corequisite: Lab component. (Typically offered: Irregular)

CATE 5443. Teaching Career Development in Public Schools. 3 Hours.

This course provides a study of curricula, methods, and techniques involved in teaching career development as related to the 16 occupational clusters. Successful completion of this course is required for licensed teachers to earn their 418 Career Development endorsement. Corequisite: Lab component. (Typically offered: Summer)

CATE 5463. Applications in Career Orientation. 3 Hours.

Student is introduced to various teaching methods and techniques of managing hands-on activities in career orientation class setting. (Typically offered: Summer)

CATE 5503. Trends and Issues in Technology Education. 3 Hours.

A comprehensive technology education methods course pertaining to the teaching of standards-based curriculum materials. (Typically offered: Fall, Spring and Summer)

CATE 5543. Technology for Teaching and Learning. 3 Hours.

A study of computer technology as it relates to teacher education. This course concentrates on knowledge and performance and includes hands-on technology activities that can be incorporated in an educational setting. Students interact with the instructor and other students via BlackBoard and engage in weekly discussions and acquire hands-on computer technology experience. (Typically offered: Fall and Summer)

CATE 5803. Teaching Apparel Production to Secondary Students. 3 Hours.

This course prepares students to teach apparel production concepts to students in secondary school settings. Topics to be covered include clothing selection, textiles, clothing care and laundry, clothing construction, and careers and technology. Problem- and project-based learning will provide the foundation for content delivery in this course. The focus on this course is on preparing preservice teachers in secondary schools to teach apparel production utilizing a variety of teaching methods. Corequisite: Lab component. (Typically offered: Spring)

Cell and Molecular Biology (CEMB)

Douglas Rhoads
Program Director
Email: drhoads@uark.edu

Adnan Alrubaye
Associate Director
Email: aakhalaf@uark.edu

Julie Brogan
Interdisciplinary Secretary
213 Gearhart Hall
479-575-4401
Email: jbrogan@uark.edu

Cell and Molecular Biology Website (<https://cell.uark.edu>)

Degrees Conferred:
M.S., Ph.D. (CEMB)

Program Description: Cell and Molecular Biology is an interdisciplinary graduate program incorporating faculty from 16 departments and four

colleges in the University of Arkansas system. Graduate studies may be pursued in any area of cell or molecular biology for which there is faculty expertise.

Primary Areas of Faculty Research: The study of various aspects of cell function, structure, metabolism, and chemical functions on, within, and between cells; the study of biomolecular interactions; the relationships between biomolecular reactions and observed cellular properties; molecular genetics, protein chemistry, biological structures; as well as the use of molecular detection methods to detect or characterize biological states in prokaryotes, eukaryotes, systematics, forensics, or health care.

M.S. in Cell and Molecular Biology

Admission to Degree Program: All applicants must have a B.A. or B.S. in a basic or applied science. Applicants must present Graduate Record Examination scores for the Verbal and Quantitative tests, and the GRE writing instrument. For admission, a student must have a sponsoring faculty member. The sponsoring faculty member will submit probable thesis subjects to the Program Committee prior to acceptance of the student. Once an applicant has been approved by the Program Committee, applications are forwarded to the Graduate School for application for admission to the Graduate School. Admitted and sponsored students will be responsible for the Graduate School's application fee unless paid by the department of the sponsoring faculty member. When deemed appropriate by the Director and Program Advisory Committee, the Cell and Molecular Biology program will allow a qualified applicant to be admitted to complete research rotations through up to three designated research laboratories during his/her first semester enrolled in the Cell and Molecular Biology graduate program. Admission for research rotations is contingent upon: 1) Stipend support has been guaranteed for the student during the rotation semesters; and 2) the Cell and Molecular Biology faculty designated for the rotation have agreed to host the student during this period. After the rotation period, the student must obtain a faculty research sponsor.

Requirements for the Master of Science Degree: For the M.S. degree, the Graduate School and/or the program requires 30 semester hours, a comprehensive examination, a cumulative GPA of 3.00, and a minimum residence of 30 weeks. Any student who receives a grade of "F" in any graduate-level course will be subject to dismissal following review by the Program Advisory Committee. All candidates for the M.S. must complete a minimum of 24 hours of post-baccalaureate graduate credits not including seminar and thesis credit hours (18 hours plus CHEM 5813 and CHEM 5843) in Cell and Molecular Biology-approved courses and 6 hours of thesis research. In addition, all candidates who are considered full-time must enroll every fall and spring semester in a Cell and Molecular Biology designated seminar course. Graduate advisory and thesis committees will consist of at least three program faculty representing at least two different departments. With the approval of the student's Graduate Advisory Committee, up to 6 hours of alternative graduate courses may be used to satisfy the 24 hours of course work. All M.S. candidates must complete a thesis based on their research and pass a comprehensive oral examination based on the thesis. Examination and approval of the thesis is by the student's Graduate Thesis Committee. Just prior to the Final Examination, the M.S. candidate will present a public seminar announced to all Cell and Molecular Biology faculty and students.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Cell and Molecular Biology

Admission to Degree Program: All applicants must have a B.A. or B.S. in a basic or applied science. Applicants must present Graduate Record Examination scores for the Verbal and Quantitative tests, and the GRE writing instrument. For admission, a student must have a sponsoring faculty member. The sponsoring faculty member will submit probable thesis subjects to the Program Committee prior to acceptance of the student. Once an applicant has been approved by the Program Committee, applications are forwarded to the Graduate School for application for admission to the Graduate School. Admitted and sponsored students will be responsible for the Graduate School's application fee unless paid by the department of the sponsoring faculty member. When deemed appropriate by the Director and Program Advisory Committee, the Cell and Molecular Biology program will allow a qualified applicant to be admitted to complete research rotations through up to three designated research laboratories during his/her first semester enrolled in the Cell and Molecular Biology graduate program. Admission for research rotations is contingent upon: 1) Stipend support has been guaranteed for the student during the rotation semesters; and 2) the Cell and Molecular Biology faculty designated for the rotation have agreed to host the student during this period. After the rotation period, the student must obtain a faculty research sponsor.

Requirements for the Doctor of Philosophy Degree: Candidates for the Ph.D. must complete 18 hours of dissertation research. Students wishing to bypass the M.S. for a Ph.D. must complete the same 24 hours of course work in Cell and Molecular Biology-approved course work as for the M.S. degree, plus a minimum of 18 hours of dissertation research. In addition, all candidates who are considered full-time must enroll every fall and spring semester in a Cell and Molecular Biology designated seminar course. Graduate advisory and dissertation committees will consist of at least four program faculty representing at least two different departments. With the approval of the student's Graduate Advisory Committee, up to 6 hours of alternative graduate courses may be used to satisfy the 24 hours of course work. Any student who receives a grade of "D" or "F" in any graduate-level course will be subject to dismissal following review by the Program Advisory Committee. Any student receiving more than two grades of "C" in courses of two or more credit hours is no longer eligible for the Ph.D., but may elect to complete an M.S. degree in the program

Candidates for the Ph.D. who do not meet the requirement for proficiency in spoken English at the time of admission must demonstrate proficiency in spoken English through a university-accepted examination prior to their candidacy exam. English proficiency courses are available at the University of Arkansas to help in this effort. Meeting this language requirement will not only prepare candidates for communication in oral examinations, research groups, national meetings, and interviews, but will also (in conjunction with the written language evaluation) enable students to serve as teaching assistants, providing an alternative mechanism for support in the event that other support is unavailable.

All Ph.D. students must complete the Candidacy Examination. The Candidacy Examination for the Ph.D. will consist of the writing of an original research proposal using the guidelines for a federally funded post-doctoral fellowship (e.g., NIH, NSF, USDA) and an oral examination over the proposal, related subjects, and general knowledge. The written and oral portions of the candidacy examination must be completed within the Ph.D. candidate's first 29 months in this program.

Students in the Ph.D. track will, in collaboration with their Graduate Advisory Committee, select a topic and format for their research proposal within the two years in the program. The proposal topic is to be within

the field of Cell and Molecular Biology but on a subject distinct from the student's Ph.D. research. The written proposal is submitted to the student's Graduate Advisory Committee for evaluation and approval or rejection. Students may submit the proposal more than once. Upon completion of an approved proposal the candidate must then pass an oral examination by the student's Graduate Advisory Committee covering the proposal, related subjects as determined by the examining committee, and general knowledge relevant to research in Cell and Molecular Biology.

Only upon satisfactory completion of the proposal and oral examination, as judged by the student's Graduate Advisory Committee, does a student become a candidate for the Ph.D. Students who fail to complete the candidacy examination in the allotted time will be dropped from the Ph.D. program but may choose to become candidates for the M.S. The Ph.D. is granted not only for fulfillment of technical requirements but also for development and possession of critical and creative thought abilities in the areas of Cell and Molecular Biology. Evidence of these abilities is given through the completion of a dissertation. The student's Graduate Dissertation Committee will evaluate the dissertation and conduct an oral Final Examination of the candidate over the dissertation and any other subject matter deemed appropriate by the committee. Administration of the final oral defense will follow the Graduate School guidelines outlined in the Graduate Catalog. Just prior to the Final Examination, the Ph.D. candidate will present a public seminar announced to all CEMB faculty and students.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

A

Adams, Paul D., Ph.D. (Case Western Reserve University), B.S. (Louisiana State University), Associate Professor, Department of Chemistry and Biochemistry, 2006.

Alverson, Andrew James, Ph.D. (University of Texas at Austin), M.S. (Iowa State University), B.S. (Grand Valley State University), Associate Professor, Department of Biological Sciences, 2012.

B

Baum, Jamie I., Ph.D., B.S. (University of Illinois-Urbana-Champaign), Associate Professor, Department of Food Science, 2011.

Beitle, Robert R., Ph.D., M.S.Ch.E., B.S.Ch.E. (University of Pittsburgh), Professor, Ralph E. Martin Department of Chemical Engineering, 1993.

Bluhm, Burt H., Ph.D., M.S. (Purdue University), B.S. (University of Oklahoma), Associate Professor, Department of Entomology and Plant Pathology, 2008.

Bottje, Walter G., Ph.D. (University of Illinois-Urbana-Champaign), M.S. (Southern Illinois University), B.S. (Eastern Illinois University), Professor, Department of Poultry Science, 1985.

Burgos, Nilda Roma, Ph.D., M.S. (University of Arkansas), B.S. (Visayas State College of Agriculture-Philippines), Professor, Department of Crop, Soil and Environmental Sciences, 1998.

C

Chen, Jingyi, Ph.D. (University of Washington), M.A. (State University College at Buffalo), B.S. (Zhongshan University), Professor, Department of Chemistry and Biochemistry, 2010.

Correll, Jim, Ph.D., M.S. (University of California-Berkeley), B.S. (Pennsylvania State University), Distinguished Professor, Department of Entomology and Plant Pathology, 1989.

D

Douglas, Marlis R., Ph.D., M.S., B.S. (University of Zurich), Professor, Department of Biological Sciences, 2012.

Douglas, Michael Edward, Ph.D. (University of Georgia), M.S., B.S. (University of Louisville), Professor, Department of Biological Sciences, 2011.

Dowling, Ashley Patrick Gregg, Ph.D. (University of Michigan-Ann Arbor), B.S. (University of Arizona), Professor, Department of Entomology and Plant Pathology, 2008.

Du, Yuchun, Ph.D. (Kagoshima University, Japan), B.S. (Shaanxi University of Technology, China), Associate Professor, Department of Biological Sciences, 2007.

Durdik, Jeannine M., Ph.D. (Johns Hopkins University), B.S. (Purdue University), Professor, Department of Biological Sciences, 1994.

E

Erf, Gisela F., Ph.D. (Cornell University), M.S., B.S. (University of Guelph, Canada), Professor, Department of Poultry Science, 1994.

Etges, William J., Ph.D. (University of Rochester), M.S. (University of Georgia), B.S. (North Carolina State University), Professor, Department of Biological Sciences, 1987.

F

Fritsch, Ingrid, Ph.D. (University of Illinois-Urbana-Champaign), B.S. (University of Utah), Professor, Department of Chemistry and Biochemistry, 1992.

G

Goggin, Fiona, Ph.D. (University of California-Davis), B.S. (Cornell University), Professor, Department of Entomology and Plant Pathology, 2001.

H

Hargis, Billy M., Ph.D., D.V.M. (University of Minnesota-Twin Cities), M.S. (University of Georgia), B.S. (University of Minnesota), Distinguished Professor, Department of Poultry Science, 2000.

Henry, Ralph Leroy, Ph.D., M.S. (Kansas State University), B.S.E. (University of Kansas), Distinguished Professor, Department of Biological Sciences, 1996.

Hestekin, Christa, Ph.D. (Northwestern University), B.S.Ch.E. (University of Kentucky), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 2006.

Hettiarachchy, Navam S., Ph.D. (University of Hull, England), M.S. (Edinburgh University, Scotland), B.S. (University of Madras, India), University Professor, Department of Food Science, 1992.

I

Ivey, Mack, Ph.D., B.S. (University of Georgia), Associate Professor, Department of Biological Sciences, 1992.

K

Kim, Jin-Woo, Ph.D. (Texas A&M University), M.S. (University of Wisconsin-La Crosse), B.S. (University of Iowa), Professor, Department of Biological and Agricultural Engineering, 2001.

Koeppel, Roger E., Ph.D. (California Institute of Technology), A.B. (Haverford College), Distinguished Professor, Department of Chemistry and Biochemistry, 1979.

Kong, Byungwhi, Ph.D., M.S. (University of Minnesota-Twin Cities), B.S. (Korea University), Associate Professor, Department of Poultry Science, 2006.

Korth, Ken L., Ph.D. (North Carolina State University), B.S. (University of Nebraska), Professor, Department of Entomology and Plant Pathology, 1999.

Kral, Timothy Alan, Ph.D. (University of Florida), B.S. (John Carroll University), Professor, Department of Biological Sciences, 1981.
Kuenzel, Wayne J., Ph.D. (University of Georgia), M.S., B.S. (Bucknell University), Professor, Department of Poultry Science, 2000.
Kwon, Young Min, Ph.D. (Texas A&M University), M.S., B.S. (Seoul National University), Associate Professor, Department of Poultry Science, 2002.

L

Lay, Jackson, Ph.D. (University of Nebraska-Lincoln), Professor, Department of Chemistry and Biochemistry, 2002.
Lehmann, Michael Herbert, Ph.D., Diploma in Biology (Philipps University of Marburg, Germany), Professor, Department of Biological Sciences, 2002.
Lessner, Daniel J., Ph.D. (University of Iowa), B.S. (University of Wisconsin-Stevens Point), Associate Professor, Department of Biological Sciences, 2008.
Lewis, Jeffrey A., Ph.D. (University of Wisconsin-Madison), B.S. (University of California-Santa Barbara), Assistant Professor, Department of Biological Sciences, 2013.
Li, Jiali, Ph.D., M.S. (City University of New York-City College), M.S. (University of Science and Technology of China), B.S. (Hei Long Jiang University), Professor, Department of Physics, 2002.
Li, Yanbin, Ph.D. (Pennsylvania State University), M.S. (University of Nebraska-Lincoln), B.S. (Shenyang Agricultural University), Distinguished Professor, Department of Biological and Agricultural Engineering, 1989.

M

McIntosh, Matt, Ph.D. (Pennsylvania State University), B.A. (Virginia Tech), Professor, Department of Chemistry and Biochemistry, 1996.
McNabb, David S., Ph.D. (Louisiana State University Health Sciences Center), B.S. (University of Texas at Arlington), Associate Professor, Department of Biological Sciences, 2000.
Millett, Francis, Ph.D. (Columbia University), B.S. (University of Wisconsin), Distinguished Professor, Department of Chemistry and Biochemistry, 1972.

P

Pereira, Andy, Ph.D. (Iowa State University), M.S. (Indian Agricultural Research Institute, India), B.Sc.Ag. (Govind Ballabh Pant University of Agriculture and Technology, India), Professor, Department of Crop, Soil and Environmental Sciences, 2011.
Pinto, Ines, Ph.D. (Louisiana State University Health Sciences Center), M.S., B.S. (University of Chile), Associate Professor, Department of Biological Sciences, 2000.

R

Rhoads, Douglas Duane, Ph.D. (Kansas State University), M.A., B.A. (Wichita State University), University Professor, Department of Biological Sciences, 1990.
Ricke, Steven C., Ph.D. (University of Wisconsin-Madison), M.S., B.S. (University of Illinois), Professor, Department of Food Science, 2005.
Rorie, Rick, Ph.D. (Louisiana State University), M.S., B.S. (University of Arkansas), Professor, Department of Animal Science, 1989.

S

Sakon, Joshua, Ph.D. (University of Wisconsin-Madison), B.S. (Southern Oregon University), Professor, Department of Chemistry and Biochemistry, 1997.
Savin, Mary Cathleen, Ph.D., M.S. (University of Rhode Island), B.S. (University of Notre Dame), Professor, Department of Crop, Soil and Environmental Sciences, 2002.

Servoss, Shannon, Ph.D. (Northwestern University), B.S.Ch.E. (University of Michigan-Ann Arbor), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 2007.
Spiegel, Frederick W., Ph.D. (University of North Carolina at Chapel Hill), B.A. (Drew University), Distinguished Professor, Department of Biological Sciences, 1982.
Srivastava, Vibha, Ph.D. (Jawaharlal Nehru University, New Delhi), M.S. (Govind Ballabh Pant University of Agriculture and Technology), B.S. (D.E.I. University), Professor, Department of Crop, Soil and Environmental Sciences, 2001.
Stenken, Julie A., Ph.D. (University of Kansas), B.S. (University of Akron), Professor, Department of Chemistry and Biochemistry, 2007.
Stephenson, Steven Lee, Ph.D., M.S. (Virginia Polytechnic Institute and State University), B.S. (Lynchburg College), Research Professor, Department of Biological Sciences, 2003.
Stites, Wesley, Ph.D. (Massachusetts Institute of Technology), M.A., B.A. (Johns Hopkins University), Professor, Department of Chemistry and Biochemistry, 1991.
Szalanski, Allen Lawrence, Ph.D. (University of Nebraska-Lincoln), M.S. (Kansas State University), B.S. (University of Manitoba), Professor, Department of Entomology and Plant Pathology, 2001.

T

Thallapuram, Suresh, Ph.D. (Osmania University), Professor, Department of Chemistry and Biochemistry, 2003.
Tian, Ryan, Ph.D. (University of Connecticut), B.S. (Fudan University, Shanghai), Associate Professor, Department of Chemistry and Biochemistry, 2004.
Tipsmark, Christian K., Ph.D., M.S. (University of Southern Denmark), Associate Professor, Department of Biological Sciences, 2010.
Tzanetakis, Ioannis E., Ph.D. (Oregon State University), M.S., B.S. (Agricultural University of Athens, Greece), Professor, Department of Entomology and Plant Pathology, 2008.

W

Wideman, Robert F., Ph.D. (University of Connecticut), B.A. (University of Delaware), Professor, Department of Poultry Science, 1993.
Wilkins, Charles L., Ph.D. (University of Oregon), B.S. (Chapman College), Distinguished Professor, Department of Chemistry and Biochemistry, 1998.
Wolchok, Jeffrey Collins, Ph.D. (University of Utah), M.S., B.S. (University of California at Davis), Associate Professor, Department of Biomedical Engineering, 2011.

Courses

CEMB 590V. Special Topics in Cell and Molecular Biology. 1-6 Hour.
 Consideration of new areas in Cell and Molecular Biology not yet treated adequately in textbooks or in other courses. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CEMB 5911. Seminar in Cell and Molecular Biology. 1 Hour.
 Discussion of current topics in Cell and Molecular Biology. All graduate students in the Cell and Molecular Biology degree program must enroll every fall and spring semester in this course or an approved alternate seminar course. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.
 This course is cross-listed with BIOL 5001.

CEMB 600V. Master's Thesis. 1-6 Hour.
 Master's thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CEMB 700V. Doctoral Dissertation. 1-18 Hour.
 Doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Chemical Engineering (CHEG)

David Ford
 Department Head
 3202 Bell Engineering Center
 479-575-4951
 Email: daveford@uark.edu

Christa N. Hestekin
 Graduate Coordinator
 3202 Bell Engineering Center
 479-575-3416
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Chemical Engineering Website (<http://chemical-engineering.uark.edu>)

Degrees Conferred:

M.S.Ch.E. (CHEG)
 Ph.D. in Engineering (CHEG) (See Engineering (p. 127))

Program Description: The goal of the graduate program in the Ralph E. Martin Department of Chemical Engineering is to prepare the student for advanced roles in the profession through a combination of planned course work and independent research activities. The graduate program allows the student to specialize in an area of interest while also broadening the graduate's intellectual abilities and enhancing career opportunities in research, teaching, management, and general engineering practice. The student's goals for pursuing an advanced degree, including preferences for a research topic, are given primary consideration in the preparation of the course of study. The student's advisory committee will assist in the definition of a diversified program to ensure competence as a practicing engineer.

Primary Areas of Faculty Research: Alternative sources of chemicals and fuels; biochemical and bioprocess engineering; biomaterials; catalysis and reaction engineering; chemical and biochemical separations; chemical process safety and hazard assessment; engineering education; materials science for nanomaterials and microelectronics; membrane materials and process engineering; statistical mechanics and molecular modeling; sustainability and life cycle analysis.

M.S.Ch.E in Chemical Engineering

Admission to the Degree Program: The specific requirements for admission to the program and completion of an advanced degree in chemical engineering are determined by the Graduate School of the University of Arkansas and the Graduate Studies Committee of the Ralph E. Martin Department of Chemical Engineering. A general summary of departmental requirements is given below and detailed information may be obtained from the Chemical Engineering website (<http://chemical-engineering.uark.edu>).

An undergraduate or M.S. degree in chemical engineering is recommended for admission to the graduate program, but students with a B.S. in another field of engineering or in a natural science may also enter the program by first taking certain undergraduate chemical engineering courses to prepare them for graduate study. The requirements for admission to the department's graduate program are:

- A grade point average of 3.0 out of 4.0 in a B.S. or M.S. in chemical engineering or, if the student does not have a degree in chemical engineering, satisfactory completion of the department's undergraduate deficiency program.

- A minimum GRE score of 155 on the quantitative section of the exam and a minimum of 307 combined score on the quantitative and verbal sections, taken within five years prior to application.
- Students without a B.S. degree from a U.S. university will need a minimum score on one of the following English proficiency exams: TOEFL paper exam – 550; iBT computer exam – 80; or IELTS – 6.5. The test must have been taken within two years prior to application.
- To enter the Ph.D. program, a majority vote by the Graduate Studies Committee of the Ralph E. Martin Department of Chemical Engineering is required.

Financial aid may be available for the student's stipend and/or tuition on a case-by-case basis. This is decided in the department.

Details about these requirements are in the Chemical Engineering Department Graduate Student Handbook, available as a downloadable PDF (<http://chemical-engineering.uark.edu/academics/graduate-program/hestekin-fall-handbook.pdf>).

Research Program: The thesis M.S. degree and the Ph.D. degree involve an interactive, hands-on program that exposes the graduate student to the techniques, procedures, and philosophy necessary for successful and ethical research. The students will work closely with their supervising professor and committee to perform original research on a topic of importance to the profession. The student will participate in the planning, managerial, budgetary, experimental, and reporting aspects of his/her research projects. The result will be a thesis (for the thesis master's degree) or a dissertation (for the Ph.D.), both of which should result in at least one journal or conference publication for the student. Active research interests of the faculty are listed on the department's research page (<http://chemical-engineering.uark.edu/research/>).

Requirements for the non-thesis M.S. Degree: At least 30 hours of course work as follows:

MATH 4423	Introduction to Partial Differential Equations ¹	3
CHEG 5113	Transport Processes I	3
CHEG 5133	Advanced Reactor Design	3
CHEG 5333	Advanced Thermodynamics	3
CHEG 6123	Transport Processes II	3
Nine hours of a 4000 or 5000 level CHEG course ²		9
Six hours of any 4000, 5000 or 6000 level technical electives ³		6
CHEG 5801	Graduate Seminar (this should be taken every semester)	1

Assisting in departmental teaching is required.

Total Hours	31
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¹ Because this is an undergraduate course, additional work will be required by the instructor for graduate credit. In addition to this course, the non-thesis student will be able to present only three more hours of 3000-level credit for the degree, with the permission of the advisory committee.

² Not to exceed 3 hours of 4000 level credit. These electives must be lecture courses, not a special project, seminar or independent research topic.

³ Not to exceed 3 hours of 4000 level credit. These electives must be lecture courses, not a special project, seminar or independent research topic.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for the thesis M.S. Degree: At least 24 hours of course work and six hours of thesis as follows:

MATH 4423	Introduction to Partial Differential Equations ¹	3
CHEG 5113	Transport Processes I	3
CHEG 5133	Advanced Reactor Design	3
CHEG 5333	Advanced Thermodynamics	3
CHEG 6123	Transport Processes II	3
Three hours of a 4000 or 5000 level CHEG course ²		3
Six hours of any 4000, 5000 or 6000 level technical electives ³		6
CHEG 600V	Master's Thesis	6
CHEG 5801	Graduate Seminar (this should be taken every semester)	1
Research resulting in a successfully defended thesis and assisting in departmental teaching are required.		
Total Hours		31

¹ Because this is an undergraduate course, additional work will be required by the instructor for graduate credit. The thesis student will not be able to present any additional hours of 3000 level credit for the degree.

² Not to exceed 3 hours of 4000 level credit. These electives must be lecture courses, not a special project, seminar or independent research topic.

³ These electives must be lecture courses, not a special project, seminar or independent research topic.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Chemical Engineering

Requirements for the Ph.D. Degree: At least 33 hours of course work and 39 hours of dissertation as follows:

MATH 5423	Introduction to Partial Differential Equations	3
CHEG 5113	Transport Processes I	3
CHEG 5133	Advanced Reactor Design	3
CHEG 5333	Advanced Thermodynamics	3
CHEG 6123	Transport Processes II	3
3 hours of a 5000 or 6000 level CHEG course		3
12 hours of any 5000 or 6000 level technical electives		12
CHEG 5801	Graduate Seminar (this should be taken every semester)	3
CHEG 700V	Doctoral Dissertation	39
Research resulting in successfully defended dissertation and assisting in departmental teaching are required.		
Total Hours		72

¹ International or non-engineering BS students must take a design course as one of their electives in addition to the above list.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty Courses

CHEG 5013. Membrane Separation and System Design. 3 Hours.

Theory and system design of cross flow membrane process--reverse osmosis, nanofiltration, ultrafiltration, and microfiltration--and applications for pollution control, water treatment, food and pharmaceutical processing. (Typically offered: Irregular)

CHEG 5043. Colloid and Interface Science. 3 Hours.

This course aims to provide essential knowledge about surface, interface, and molecular self-organization. At the end of this course students should understand (i) basic concepts to describe phenomena at surfaces, (ii) molecular self-organization, and (iii) basic techniques for characterization of surfaces and interfaces. (Typically offered: Spring Odd Years)

CHEG 5113. Transport Processes I. 3 Hours.

Fundamental concepts and laws governing the transfer of momentum, mass, and heat. (Typically offered: Fall)

CHEG 5133. Advanced Reactor Design. 3 Hours.

Applied reaction kinetics with emphasis on the design of heterogeneous reacting systems including solid surface catalysis, enzyme catalysis, and transport phenomena effects. Various types of industrial reactors, such as packed bed, fluidized beds, and other non-ideal flow systems are considered. (Typically offered: Spring)

CHEG 5273. Corrosion Control. 3 Hours.

Qualitative and quantitative introduction to corrosion and its control. Application of the fundamentals of corrosion control in the process industries is emphasized. (Typically offered: Spring)

CHEG 5333. Advanced Thermodynamics. 3 Hours.

Methods of statistical thermodynamics, the correlation of classical and statistical thermodynamics, and the theory of thermodynamics of continuous systems (non-equilibrium thermodynamics). (Typically offered: Fall)

CHEG 5353. Advanced Separations. 3 Hours.

Phase equilibrium in non-ideal and multicomponent systems, digital and other methods of computation are included to cover the fundamentals of distillation, absorption, and extraction. (Typically offered: Irregular)

CHEG 5443. Chemical Engineering Design II. 3 Hours.

A capstone design class designed for graduate students who do not have an engineering degree. Responsibility for decision making is placed on the students in the solution of a comprehensive, open ended problem based on an industrial process. Both formal oral and formal written presentation of results are required. Students may not receive credit for both CHEG 4443 and CHEG 5443. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CHEG 5513. Biochemical Engineering Fundamentals. 3 Hours.

An introduction to bioprocessing with an emphasis on modern biochemical engineering techniques and biotechnology. Topics include: basic metabolism (prokaryote and eucaryote), biochemical pathways, enzyme kinetics (including immobilized processes), separation processes (e.g. chromatography) and recombinant DNA methods. Material is covered within the context of mathematical descriptions (calculus, linear algebra) of biochemical phenomenon. (Typically offered: Spring Even Years)

CHEG 5733. Polymer Theory and Practice. 3 Hours.

Theories and methods for converting monomers into polymers are presented. Topics include principles of polymer science, commercial processes, rheology, and fabrication. (Typically offered: Irregular)

CHEG 5773. Medical Applications of Membranes Theory, Current Uses, and Development Areas. 3 Hours.

The course will cover most present-day medical products, treatments, and surgical equipment that rely on membrane transport and/or separation to function effectively. Membranes or membrane devices are used when certain human organs stop working or lose some degree of effectiveness. Those that will be covered in this course include the kidney, the pancreas, the lungs, the skin, and the eye. Localized, controlled-release of medications is also an area where membranes are used in medicine and this area will be described also. Along with dialysis, other external membrane treatment processes such as membrane plasmapheresis (a process whereby a membrane is used to separate blood cells from plasma and thereby opening the door for more effectively treating the cells or plasma separately outside of the body) will be discussed. (Typically offered: Irregular)

CHEG 5801. Graduate Seminar. 1 Hour.

Students hear and present oral presentations on innovations in a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 12 hours of degree credit.

CHEG 588V. Special Problems. 1-6 Hour.

Opportunity for individual study of an advanced chemical engineering problem not sufficiently comprehensive to be a thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CHEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CHEG 6123. Transport Processes II. 3 Hours.

Continuation of CHEG 5113. Prerequisite: CHEG 5113. (Typically offered: Spring)

CHEG 688V. Special Topics in Chemical Engineering. 1-3 Hour.

Advanced study of current Chemical Engineering topics not covered in other courses. Prerequisite: Doctoral students only. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

CHEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Chemistry and Biochemistry (CHBC)

Matt McIntosh
Department Chair
119 Chemistry Building
479-575-4362
Email: mcintosh@uark.edu

Julie Stenken
Director of Graduate Studies
119 Chemistry Building
479-575-7945
Email: jstenken@uark.edu

Department of Chemistry and Biochemistry Website (<https://fulbright.uark.edu/departments/chemistry/>)

Degrees Conferred:

M.S., Ph.D. in Chemistry (CHEM)

Areas of Study: Analytical, inorganic, organic, physical, biophysical, and biochemistry.

Primary Areas of Faculty Research: Specialized centers complement traditional research areas in the Department of Chemistry and Biochemistry. These include the Center for Protein Structure and Function and the State-Wide Mass Spectrometry Facility.

Requirements for M.S. in Chemistry

Admission to Graduate Program: In addition to the application for admission to the Graduate School and the transcripts required for Graduate School admission, applicants for admission to the degree programs of the Department of Chemistry and Biochemistry must submit a.) three letters of recommendation from persons familiar with the applicant's previous academic and professional performance and b.) official scores from the Graduate Record Examination (General Test). Advanced subject GRE tests scores (Chemistry, Biochemistry, etc.) are encouraged but not required.

Basic Program for Advanced Degree Candidates: In addition to the material given below, the student is referred to the general Graduate School requirements mentioned earlier in this catalog and to the bulletin *Information for Graduate Students in Chemistry and Biochemistry* available from the Department of Chemistry and Biochemistry.

1. An undergraduate program, consisting of courses in general chemistry, analytical chemistry (two semesters), organic chemistry (three semesters), physical chemistry (two semesters), and inorganic chemistry (one semester) provide an adequate foundation for graduate work in chemistry and biochemistry. If a graduate student lacks any part of this introductory program, it must be completed within the first four semesters as a graduate student. If the student has the necessary prerequisites, courses for graduate credit may be taken concurrently. Proficiency in physical chemistry must be demonstrated by satisfactory performance on placement examinations. Inadequate performance may be remedied by enrollment in one or more recommended courses.
2. The department has no foreign language requirement for either the M.S. or Ph.D. degree.
3. Each advanced degree candidate must present a suitable program of advanced courses and research. The specific courses needed to provide a basis for scholarly work beyond the B.S. level will vary with the student's undergraduate preparation, area of concentration and the degree sought. Individual course enrollments must be approved initially by the graduate adviser and subsequently by the student's advisory committee.
4. Every student must register for a minimum of one credit hour of CHEM 600V or CHEM 700V in each term during which the student is present and doing thesis or dissertation research. Post-candidacy doctoral students are required to be enrolled in at least one hour of dissertation credit (CHEM 700V) every semester (fall, spring, summer), until the degree is conferred.

Additional Requirement for Master of Science Degree: The Master of Science degree in Chemistry requires a minimum 24 hours of course work plus six hours of thesis. A thesis reporting original research will be required of all candidates for the Master of Science degree in chemistry.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Ph.D. in Chemistry

Additional Requirements for the Doctor of Philosophy Degree: A doctoral advisory committee is appointed to evaluate the candidate's preparation and to draw up a suitable program of study and research. This

committee consists of the student's major professor and at least three other members of the graduate faculty. Under most circumstances, the major professor serves as the chairperson of that committee.

For chemistry students, the candidacy examination is of the cumulative type. Five cumulative examinations are given each semester in each of the areas of concentration mentioned above. To complete the candidacy examination, seven of these cumulative examinations must be passed within a specified time, usually by the end of the fifth semester of graduate work.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Adams, Paul D., Ph.D. (Case Western Reserve University), B.S. (Louisiana State University), Associate Professor, 2006.

Allison, Neil T., Ph.D. (University of Florida), B.S. (Georgia College), Associate Professor, 1980.

Beyzavi, M. Hassan, Ph.D. (Freie Universität Berlin, Germany), Assistant Professor, 2017.

Brewer, Lorraine C., M.S. (University of Wisconsin-Madison), Instructor, 1997.

Chen, Jingyi, Ph.D. (University of Washington), M.A. (State University College at Buffalo), B.S. (Zhongshan University), Professor, 2010.

Chevrier, Vincent Francois, Ph.D. (CEREGE, Aix-en-Provence, France), M.E.S. (University Paris VII), B.S. (Academy of Versailles, France), Research Associate Professor, 2005.

Coridan, Robert, Ph.D., M.S. (University of Illinois-Urbana-Champaign), B.S. (The Ohio State University), Assistant Professor, 2015.

Fan, Chenguang, Ph.D. (Iowa State University), B.S. (Nanjing University), Assistant Professor, 2016.

Fritsch, Ingrid, Ph.D. (University of Illinois-Urbana-Champaign), B.S. (University of Utah), Professor, 1992.

Greathouse, Denise A., Ph.D. (University of Arkansas), Research Associate Professor, 1997.

He, Maggie, Ph.D. (ETH Zürich), M.S. (University of Pennsylvania), B.S. (City College of New York), Assistant Professor, 2019.

Heyes, Colin David, Ph.D. (Georgia Institute of Technology), B.S. (Loughborough University), Associate Professor, 2008.

Kilyanek, Stefan M., Ph.D., M.S. (University of Chicago), B.S. (Grand Valley State University), Associate Professor, 2014.

Koeppel, Roger E., Ph.D. (California Institute of Technology), A.B. (Haverford College), Distinguished Professor, 1979.

Lay, Jackson, Ph.D. (University of Nebraska-Lincoln), Professor, 2002.

Mazzanti, Christopher L., Ph.D., M.S. (University of Arkansas), B.S. (University of Arkansas at Monticello), Instructor, 2012.

McIntosh, Matt, Ph.D. (Pennsylvania State University), B.A. (Virginia Tech), Professor, 1996.

Millett, Francis, Ph.D. (Columbia University), B.S. (University of Wisconsin), Distinguished Professor, 1972.

Moradi, Mahmoud, Ph.D. (North Carolina State University), M.S., B.S. (Sharif University of Technology), Assistant Professor, 2015.

Sakon, Joshua, Ph.D. (University of Wisconsin-Madison), B.S. (Southern Oregon University), Professor, 1997.

Shi, Wei, Ph.D. (University of Alberta), M.S. (East China University of Science and Technology), B.S. (Shanghai Jiao Tong University), Assistant Professor, 2012.

Stenken, Julie A., Ph.D. (University of Kansas), B.S. (University of Akron), Professor, 2007.

Stites, Wesley, Ph.D. (Massachusetts Institute of Technology), M.A., B.A. (Johns Hopkins University), Professor, 1991.

Striegler, Susanne, Ph.D., M.S., B.S. (Ulm University, Germany), Professor, 2012.

Thallapuram, Suresh, Ph.D. (Osmania University), Professor, 2003.

Tian, Ryan, Ph.D. (University of Connecticut), B.S. (Fudan University, Shanghai), Associate Professor, 2004.

Wang, Feng, Ph.D. (University of Pittsburgh), Ph.D. (Kutztown University of Pennsylvania), Associate Professor, 2012.

Wilkins, Charles L., Ph.D. (University of Oregon), B.S. (Chapman College), Distinguished Professor, 1998.

Zheng, Nan, Ph.D. (University of Michigan-Ann Arbor), M.S. (University of Rochester), B.S. (University of Science and Technology of China), Associate Professor, 2008.

Courses

CHEM 505V. Special Topics in Chemistry. 1-4 Hour.

(Formerly CHEM 405V.) Potential topics include: advanced spectroscopic methods, bioanalytical chemistry, bioinorganic chemistry, bioorganic chemistry, biophysical chemistry, chemical sensors, drug discovery and design, nanomaterials, pharmaceutical chemistry, process analytical chemistry, and protein folding and design. Graduate degree credit will not be given for both CHEM 405V and CHEM 505V. Prerequisite: Instructor consent. (Typically offered: Irregular)

CHEM 5101. Introduction to Research. 1 Hour.

This eight week course introduces new graduate students to research opportunities and skills in chemistry and biochemistry. Meets 2 hours per week in the first half of the semester. Safety and ethics in research and scholarship are discussed. Students learn about research programs in the department to aid in choosing an advisor. (Typically offered: Fall)

CHEM 5123. Advanced Inorganic Chemistry. 3 Hours.

Reactions and properties of inorganic compounds from the standpoint of electronic structure and the periodic table. Emphasis on recent developments. Knowledge comparable to material in CHEM 3453 is recommended. (Typically offered: Fall)

CHEM 5143. Advanced Inorganic Chemistry II. 3 Hours.

Chemistry of metallic and non-metallic elements emphasizing molecular structure, bonding and the classification of reactions. Knowledge of inorganic chemistry comparable to material in CHEM 4123 and CHEM 5123 is recommended. (Typically offered: Irregular)

CHEM 5153. Structural Chemistry. 3 Hours.

Determination of molecular structure by diffraction, spectroscopic, and other techniques. Illustrative examples will be chosen from inorganic chemistry and biochemistry. (Typically offered: Irregular)

CHEM 5213. Instrumental Analysis. 3 Hours.

Provides students, especially those in the physical, agricultural, and biological sciences, with an understanding of the theory and practice of modern instrumental techniques of analysis. Lecture 3 hours per week. Knowledge comparable to material in CHEM 2263 and CHEM 3603 is recommended. (Typically offered: Spring)

CHEM 5233. Chemical Separations. 3 Hours.

Modern separation methods including liquid chromatography (adsorption, liquid-liquid partition, ion exchange, exclusion) and gas chromatography. Theory and instrumentation is discussed with emphasis on practical aspects of separation science. Prerequisite: CHEM 4213. (Typically offered: Fall Even Years)

CHEM 5243. Electrochemical Methods of Analysis. 3 Hours.

Topics will include diffusion, electron transfer kinetics, and reversible and irreversible electrode processes followed by a discussion of chronoamperometry, chronocoulometry, polarography, voltammetry, and chronopotentiometry. Knowledge of analytical chemistry comparable to material in CHEM 4213 is recommended. (Typically offered: Spring Even Years)

CHEM 5253. Spectrochemical Methods of Analysis. 3 Hours.

Principles and methods of modern spectroscopic analysis. Optics and instrumentation necessary for spectroscopy is also discussed. Topics include atomic and molecular absorption and emission techniques in the ultraviolet, visible, and infrared spectral regions. Knowledge of analytical chemistry comparable to material in CHEM 4213 is recommended. (Typically offered: Fall Odd Years)

CHEM 5283. Energy Conversion and Storage. 3 Hours.

Fundamental and applied concepts of energy storage and conversion with sustainability implications. Chemical reactions (kinetics, thermodynamics, mass transfer), emphasizing oxidation-reduction, electrochemical, and interfacial processes, and impact on performance of fuel and biofuel cells, batteries, supercapacitors, and photochemical conversion. (Typically offered: Fall Even Years)

CHEM 5383. Chemometrics. 3 Hours.

Chemometrics is the process of extracting relevant information from chemical data by mathematical and statistical tools. These tools allow for designing optimal experimental procedures, extracting important information from complex chemical systems, and better understanding of complex chemical systems. (Typically offered: Spring Even Years)

CHEM 5443. Physical Chemistry of Materials. 3 Hours.

Physical and chemical characteristics of materials and discussion of the science behind materials engineering and performance. Topics include theory, principles of characterization methods, modeling, and applications in the context of materials. Knowledge comparable to material in CHEM 3514 and CHEM 3504 or CHEM 3453 or CHEG 3713 or MEEG 2403 is recommended. (Typically offered: Irregular)

CHEM 5453. Quantum Chemistry I. 3 Hours.

Fundamental quantum theory: Hamiltonian formalism in classical mechanics, Schrodinger equation, operators, angular momentum, harmonic oscillator, barrier problems, rigid rotator, hydrogen atom, and interaction of matter with radiation. Knowledge of physical chemistry comparable to material in CHEM 3504 is recommended. (Typically offered: Spring Odd Years)

CHEM 5473. Chemical Kinetics. 3 Hours.

Theory and applications of the principles of kinetics to reactions between substances, both in the gaseous state and in solution. Knowledge of physical chemistry comparable to material in CHEM 3514 is recommended. (Typically offered: Spring)

CHEM 5573. Statistical Thermodynamics. 3 Hours.

Covers fundamentals in thermodynamics, molecular dynamics, Monte Carlo, phase transitions, behavior of gases and liquids and basic concepts in chemical kinetics and physical kinetics. Knowledge comparable to physical chemistry materials in CHEM 3514 is recommended. (Typically offered: Irregular)

CHEM 5603. Physical Organic Chemistry. 3 Hours.

Introduction to the theoretical interpretation of reactivity, reaction mechanisms, and molecular structure of organic compounds. Application of theories of electronic structure; emphasis on recent developments. Knowledge of material comparable to CHEM 3613, CHEM 3613H, CHEM 3713 and CHEM 3514 is recommended. (Typically offered: Fall)

CHEM 5633. Organic Reactions. 3 Hours.

The more important types of organic reactions and their applications to various classes of compounds. Knowledge of organic chemistry comparable to material in CHEM 3603 is recommended. (Typically offered: Irregular)

CHEM 5723. Experimental Methods in Organic Chemistry. 3 Hours.

Introduction to the application of synthetic and spectroscopic methods in organic chemistry, including mass spectrometry, infrared spectroscopy, and nuclear magnetic resonance spectrometry. Lecture 3 hours per week. Knowledge comparable to material in CHEM 3613 is recommended. (Typically offered: Fall)

CHEM 5753. Methods of Organic Analysis. 3 Hours.

Interpretation of physical measurements of organic compounds in terms of molecular structure. Emphasis on spectroscopic methods (infrared, ultraviolet, magnet resonance, and mass spectra). Knowledge of organic chemistry comparable to material in CHEM 3603 is recommended. (Typically offered: Fall)

CHEM 5813. Biochemistry I. 3 Hours.

The first of a two-course series covering biochemistry for graduate students in biology, agriculture, and chemistry. Topics covered include protein structure and function, enzyme kinetics, enzyme mechanisms, and nucleic acid and carbohydrate structures. Knowledge of organic chemistry comparable to material in CHEM 3613 is recommended. (Typically offered: Fall)

CHEM 5843. Biochemistry II. 3 Hours.

A continuation of CHEM 5813 covering topics including biological membranes and bioenergetics, photosynthesis, lipids and lipid metabolism, nucleic acid and amino acid metabolism, and molecular biology. Knowledge of organic chemistry comparable to material in CHEM 3613 is recommended. Prerequisite: CHEM 5813. (Typically offered: Spring)

CHEM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Chemistry graduate students enroll in this course as needed until all CUMES are passed and the student is officially a doctoral candidate. Prerequisite: Chemistry graduate student. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CHEM 6011. Chemistry Seminar. 1 Hour.

Weekly discussion of current chemical research. Departmental and divisional seminars in analytical chemistry, biochemistry, inorganic, organic, and physical chemistry are held weekly. Seminar credit does not count toward the minimum hourly requirements for any chemistry graduate degree. (Typically offered: Fall and Spring) May be repeated for degree credit.

CHEM 619V. Special Topics in Inorganic Chemistry. 1-3 Hour.

Topics which have been covered in the past include: technique and theory of x-ray diffraction, electronic structure of transition metal complexes, inorganic reaction mechanisms, and physical methods in inorganic chemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 6283. Mass Spectrometry. 3 Hours.

This course is devoted to the fundamental principles and applications of analytical mass spectrometry. Interactions of ions with magnetic and electric fields and the implications with respect to mass spectrometer design are considered, as are the various types of mass spectrometer sources. Representative applications of mass spectrometry in chemical analysis are also discussed. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

CHEM 629V. Special Topics in Analytical Chemistry. 1-3 Hour.

Topics that have been presented in the past include: electroanalytical techniques, kinetics of crystal growth, studies of electrode processes, lasers in chemical analysis, nucleosynthesis and isotopic properties of meteorites, thermoluminescence of geological materials, early solar system chemistry and analytical cosmochemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 649V. Special Topics in Physical Chemistry. 1-3 Hour.

Topics which have been covered in the past include advanced kinetics, solution chemistry, molecular spectra, nuclear magnetic resonance spectroscopy, and methods of theoretical chemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 6633. Chemistry of Organic Natural Products. 3 Hours.

Selected topics concerned with structure elucidation and synthesis of such compounds as alkaloids, antibiotics, bacterial metabolites, plant pigments, steroids, terpenoids, etc. Prerequisite: CHEM 5603 and CHEM 5633. (Typically offered: Irregular)

CHEM 6643. Organometallic Chemistry. 3 Hours.

Theories and principles of organometallic chemistry. Concepts include bonding, stereochemistry, structure and reactivity, stereochemical principles, conformational, steric and stereoelectronic effects. Transition metal catalysis of organic reactions will also be described. Knowledge of material comparable to CHEM 3713 and CHEM 3514 is recommended. (Typically offered: Irregular)

CHEM 669V. Special Topics in Organic Chemistry. 1-3 Hour.

Topics which have been presented in the past include heterogeneous catalysis, isotope effect studies of organic reaction mechanisms, organometallic chemistry, stereochemistry, photochemistry, and carbanion chemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 6823. Physical Biochemistry. 3 Hours.

Physical chemistry of proteins, nucleic acids, and biological membranes. Ultracentrifugation, absorption and fluorescent spectrophotometry, nuclear magnetic resonance spectroscopy, x-ray diffraction, and other techniques. Prerequisite: CHEM 5813. (Typically offered: Fall Even Years)

CHEM 6863. Enzymes. 3 Hours.

Isolation, characterization, and general chemical and biochemical properties of enzymes. Kinetics, mechanisms, and control of enzyme reactions. Prerequisite: CHEM 5813 and CHEM 5843. (Typically offered: Fall Odd Years)

CHEM 6873. Molecular Biochemistry. 3 Hours.

Nucleic acid chemistry in vitro and in vivo, synthesis of DNA and RNA, genetic diseases, cancer biochemistry and genetic engineering. Prerequisite: CHEM 5813 and CHEM 5843. (Typically offered: Spring Odd Years)

CHEM 6883. Bioenergetics and Biomembranes. 3 Hours.

Cellular energy metabolism, photosynthesis, membrane transport, properties of membrane proteins, and the application of thermodynamics to biological systems. Prerequisite: CHEM 5813 and CHEM 5843. (Typically offered: Spring Even Years)

CHEM 700V. Doctoral Dissertation. 1-12 Hour.

Doctoral Dissertation. For chemistry graduate students who have passed all CUMES and have officially been admitted to doctoral candidacy. Prerequisite: Chemistry graduate student. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Civil Engineering (CVEG)

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Civil Engineering website (<http://cveg.uark.edu>)

Degrees Conferred:

M.S.C.E. in Civil Engineering (CVEG)
M.S. in Construction Management (CSMG) (Go to Construction Management (p. 90))
M.S.En.E. in Environmental Engineering (ENEG) (Go to Environmental Engineering (p. 142))
Ph.D. in Engineering (CVEG) (Go to Engineering (p. 127))

Program Description: The Master of Science in Civil Engineering program is intended primarily for students possessing the Bachelor of Science in Civil Engineering degree. Students with degrees from other

engineering disciplines may be admitted to the program but will be required to complete some undergraduate civil engineering courses as preparation for their graduate studies. The specific courses required will depend on the emphasis of their graduate studies. The objectives of the M.S.C.E. program are to provide a greater depth of understanding of civil engineering topics for the practice of engineering and to serve as preparation for doctoral studies. Students are allowed a great deal of flexibility in designing their course of study. Students desiring to develop a deeper understanding of one sub-discipline area may select courses solely concentrated in that area while those desiring a broader-based education may select courses from several sub-disciplines including courses from other disciplines.

Primary Areas of Faculty Research: The Department of Civil Engineering has ongoing research programs in the environmental/water resources, geotechnical, structural, and transportation areas. The following is a more detailed listing of topics currently being studied in each of these areas:

- **Environmental/Water Resources Area:** Water and wastewater treatment; decentralized collection and treatment systems; soil and groundwater remediation; surface and ground water quality; storm water pollution prevention; environmental and hydrologic modeling; water quality studies.
- **Geotechnical Area:** Aggregates and base materials; geosynthetic reinforcement; embankment and slope stability; field instrumentation and measurement of soil properties; soil and groundwater remediation using geosynthetics; GIS application to geotechnical engineering; foundation design.
- **Structural Area:** High performance concrete; structural materials; bridge deck rehabilitation; computational mechanics; computational wind engineering and tornado modeling; structural earthquake analysis and modeling; structural steel design and analysis.
- **Transportation Area:** Facility design; roadway geometrics; traffic operations and safety; pavement design and rehabilitation; asphalt concrete mixture design; construction materials characterization; construction quality control; geosynthetic reinforced flexible pavements; transportation management systems; high-speed pavement condition data acquisition; and transportation and land development.

In addition to these core areas, the Department of Civil Engineering is also actively pursuing research in the areas of alternative energy sources, infrastructure security, nanotechnology, and sustainability.

M.S.C.E. in Civil Engineering

Requirements for the Master of Science in Civil Engineering Degree:

Minimum 30 semester hours of graduate-level credit for thesis option; or 30 semester hours of graduate-level non thesis or research credit for course work only option.

1. Candidates for the degree who present a thesis are required to complete a minimum of 24 semester hours of course work and a minimum of six semester hours of thesis.
2. Candidates for the degree who do not present a thesis are required to complete a minimum of 30 semester hours of graduate-level course work.
3. Candidates for the degree must present a cumulative grade point average of 3.00 on all graduate courses. The minimum acceptable grade for any course is "C."
4. Upon admission to the Graduate School and acceptance in a program of study, candidates pursuing a thesis-based program

will be assigned to a major adviser, who in consultation with the department head, will select a graduate committee. With guidance from the committee, the candidate will develop a plan of study and a research project to be completed by the candidate. The committee will serve as the examination committee for the final oral and/or written examination and for the thesis. Candidates pursuing a coursework-based program will be assigned to a major adviser, who will assist the candidate in developing a plan of study; the major adviser will coordinate the final and/or written examination.

5. All graduate students enrolled in the M.S.C.E. program in the Department of Civil Engineering must successfully complete one semester of CVEG 5000 Graduate Seminar in Civil Engineering.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Civil Engineering

Requirements for the Doctor of Philosophy (Ph.D.) degree with emphasis in Civil Engineering: Minimum 72 semester hours of graduate-level credit beyond the baccalaureate degree; minimum 42 semester hours of graduate-level credit beyond the master's degree.

1. Candidates for the degree are required to complete a minimum of 36 semester hours of graduate-level course work and a minimum of 18 semester hours of dissertation. Graduate-level course work comprising an earned master's degree may be included in the minimum course work credit hours for the Ph.D. degree.
2. Candidates for the degree must present a cumulative grade point average of 3.00 on all graduate courses. The minimum acceptable grade for any course is "C."
3. All graduate students enrolled in the Ph.D. program in the Department of Civil Engineering must successfully complete two semesters of CVEG 5000 Graduate Seminar in Civil Engineering.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Bernhardt-Barry, Michelle, Ph.D., M.S.C.E., B.S.C.E. (Texas A&M University), Associate Professor, 2013.

Braham, Andrew F., Ph.D. (University of Illinois-Urbana-Champaign), M.S., B.S. (University of Wisconsin-Madison), Associate Professor, 2010.

Coffman, Rick, Ph.D. (University of Missouri-Columbia), M.S. (University of Texas at Austin), B.S. (University of Wyoming), Associate Professor, 2009.

Dennis, Norman D., Ph.D. (University of Texas at Austin), M.B.A. (Boston University), M.S.C.E., B.S.C.E. (Missouri University of Science and Technology), University Professor, 1996.

Edwards, Findlay, Ph.D. (New Mexico State University), M.S. (University of New Mexico), M.S.C.E. (New Mexico State University), Associate Professor, 1999.

Fairey, Julian, Ph.D., M.S.C.E. (University of Texas at Austin), B.S.C.E. (University of Alberta, Canada), Associate Professor, 2008.

Fernstrom, Eric, Ph.D. (University of Arkansas), Instructor, 2014.

Gattis, J. L., Ph.D. (Texas A&M University), M.S.C.E. (University of Texas Arlington), B.S.C.E. (University of Arkansas), Professor, 1993.

Hale, Micah, Ph.D., M.S.C.E., B.S.C.E. (University of Oklahoma), Professor, 2002.

Hall, Kevin D., Ph.D. (University of Illinois-Urbana-Champaign), M.S.C.E., B.S.C.E. (University of Arkansas), Professor, 1993.

Hernandez, Sarah, Ph.D., M.S. (University of California, Irvine), B.S. (University of Florida), Assistant Professor, 2015.

Heymfield, Ernie, Ph.D. (City University of New York), M.S.C.E. (Polytechnic University), Associate Professor, 2001.

Johnson, Michael, M.S.C.E. (University of Pittsburgh), B.S.C.E. (University of Minnesota), B.A. (Chapman College), Professor, 2010.

Mitra, Suman, Ph.D. (University of California, Irvine), M.S., B.S. (Bangladesh University of Engineering and Technology), Assistant Professor, 2019.

Morrow, Tommy K., Ph.D. (University of Texas at Austin), Instructor, 2019.

Prinz, Gary S., Ph.D., M.S., B.S. (Brigham Young University), Associate Professor, 2014.

Selvam, R. Panneer, Ph.D. (Texas Tech University), M.S.C.E. (South Dakota School of Mines and Technology), M.E., B.E. (University of Madras, India), University Professor, 1986.

Williams, Rodney D., Ph.D., M.S., B.S.C.E. (University of Arkansas), Assistant Professor, 1998.

Williams, Stacy Goad, Ph.D., M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, 1997.

Wood, Clinton M., Ph.D. (University of Texas at Austin), M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, 2013.

Zhang, Wen, Ph.D. (Purdue University), M.S. (University of Kansas), Assistant Professor, 2011.

Courses

CVEG 5000. Graduate Seminar in Civil Engineering. 0 Hours.

A weekly seminar devoted to civil engineering research topics. Appropriate grade to be 'S'. (Typically offered: Fall and Spring)

CVEG 5103. Geosynthetic Applications in Civil Engineering. 3 Hours.

Geosynthetic Applications in Civil Engineering: The functional properties of various geosynthetic materials are defined as they relate to; reinforcement, separation, filtration, and drainage applications. Design procedures are developed for the use of geosynthetics in transportation, environmental and geotechnical applications. Prerequisite: CVEG 3132 and CVEG 3131L or equivalent. (Typically offered: Irregular)

CVEG 5113. Soil Dynamics. 3 Hours.

This course covers propagation of stress waves in elastic and inelastic materials, dynamic loading of soils, and stiffness and damping properties of soils. Use of field and laboratory techniques to determine shear wave velocity of soils. Also includes applications of dynamic soil properties in site stiffness characterization, geotechnical earthquake engineering, evaluation of ground improvement, and design of machine foundations. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5123. Measurement of Soil Properties. 3 Hours.

Consideration of basic principles involved in measuring properties of soils. Detailed analysis of standard and specialized soil testing procedures and equipment. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5133. Geotechnical Site Characterization. 3 Hours.

One of primary tasks of geotechnical engineers is to perform in-situ site characterization for engineering design of foundations, retaining structures, roads, bridges and other infrastructure. This course will focus on in-situ investigations performed for the purpose of collecting detailed site characterization data for direct and/or indirect use in geotechnical design. Specifically, we will study various static (e.g., SPT, CPT, VST, DMT, PMT) and dynamic (e.g., CHT, DHT, SW, GPR) in-situ tests used to obtain estimates of stratigraphy, density, strength, stress history, modulus, and permeability of geotechnical materials. We will predominantly focus on site characterization of soil sites, but will mention rock testing and design methods when appropriate. Prerequisite: CVEG 4143 or the equivalent. (Typically offered: Irregular)

CVEG 5143. Transportation Soils Engineering. 3 Hours.

Advanced study of the properties of surficial soils; soil classification systems; pedology; soil occurrence and variability; subgrade evaluation procedures; repeated load behavior of soils; soil compaction and field control; soil stabilization; soil trafficability and subgrade stability for transportation facilities. Prerequisite: CVEG 3132. (Typically offered: Irregular)

CVEG 5153. Earth Retaining Structures. 3 Hours.

This course will focus on the analysis and design of earth retaining structures. Specifically, we will discuss soil and rock property design parameter selection, lateral earth pressures for wall system design, and load and resistance factor design (LRFD) for retaining walls. Wall types discussed include gravity and semi-gravity walls, modular gravity walls, MSE walls, nongravity cantilever walls and anchored walls, and in-situ reinforced walls. Information on wall system feasibility and selection, construction materials and methods, cost information, and design and performance information will be discussed. Prerequisite: CVEG 4143 or equivalent. (Typically offered: Irregular)

CVEG 5163. Seepage and Consolidation. 3 Hours.

Investigation of the flow of water through soils and the time rate of compression of soils. Characterization of the hydraulic conductivity of soils in the field, seepage through earth dams, excavation cut-off walls, and other seepage control systems. Analytical and experimental investigations of soil volume change under hydraulic and mechanical loading. Design of earth and rock dams, well pumping, and vertical and radial consolidation in embankments. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5173. Advanced Foundations. 3 Hours.

Study of soil-supported structures. Topics include drilled piers, slope stability, pile groups, negative skin friction, foundation design from the standard penetration test and Dutch cone, and other specialized foundation design topics. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5183. Geo-Environmental Engineering. 3 Hours.

Study of the geotechnical aspects of waste containment systems and contaminant remediation applications. Analysis and measurement of flow of water and contaminants through saturated and unsaturated soils, clay mineralogy and soil-chemical compatibility, and mechanical and hydraulic behavior of geomembranes, geotextiles, and geosynthetic clay liners. Design and construction aspects of compacted clay and composite landfill liners, drainage systems, and landfill covers. Prerequisite: CVEG 3132 or graduate standing. (Typically offered: Irregular)

CVEG 5193. Geotechnical Earthquake Engineering. 3 Hours.

This course covers stress wave propagation in soil and rock; influence of soil conditions on seismic ground motion characteristics; evaluation of site response using wave propagation techniques; liquefaction of soils; seismic response of earth structures and slopes. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5203. Water Chemistry. 3 Hours.

This course provides a basis for applying principles of physical chemistry to understanding the composition of natural waters and to the engineering of water and wastewater treatment processes. Topics covered include chemical equilibrium (algebraic, graphical, and computer-aided solution techniques); acid-base equilibria and buffering; oxidation and reduction reactions; and solid precipitation and dissolution. Prerequisite: Graduate standing or CVEG 3243 and instructor approval. (Typically offered: Spring)

CVEG 5213. Advanced Water Treatment Design. 3 Hours.

Design of industrial and municipal water treatment plants. Discussion of raw and treated water requirements for several uses. Prerequisite: CVEG 3243. (Typically offered: Spring)

CVEG 5224. Advanced Wastewater Treatment Design. 4 Hours.

Application of advanced techniques for the analysis of wastewater treatment facilities. Physical, chemical and biological processes for removing suspended solids, organics, nitrogen, and phosphorus. Laboratory treatability studies will be used to develop design relationships. Lecture 3 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CVEG 4243 or graduate standing. (Typically offered: Fall)

CVEG 5233. Microbiology for Environmental Engineers. 3 Hours.

Fundamental and applied aspects of microbiology and biochemistry relating to water quality control, wastewater treatment, and stream pollution. Prerequisite: CVEG 3243. (Typically offered: Irregular)

CVEG 5243. Groundwater Hydrology. 3 Hours.

Detailed analysis of groundwater movement, well hydraulics, groundwater pollution and artificial recharge. Surface and subsurface investigations of groundwater and groundwater management, saline intrusion and groundwater modeling will be addressed. Prerequisite: CVEG 3223. (Typically offered: Irregular)

CVEG 5253. Physical-Chemical Processes for Water and Wastewater Treatment. 3 Hours.

This course provides a fundamental understanding of physical and chemical processes used in the treatment of drinking water and wastewater. Principals of mass balance are applied to understand the impact of reactor hydraulics (ideal and non-ideal flow) and reaction kinetics on process performance and identify important process variables. Chemical processes covered include disinfection, gas transfer, adsorption, and ion exchange; physical processes covered include coagulation, flocculation, sedimentation, filtration, and membranes. Prerequisite: Graduate standing and instructor consent. (Typically offered: Fall Odd Years)

CVEG 5273. Open Channel Flow. 3 Hours.

Open Channel Flow includes advanced open channel hydraulics, flow measurement techniques, a hydrology review, culvert and storm drainage facility design, natural channel classification (fluvial geomorphology) and rehabilitation, computer methods and environmental issues. Prerequisite: CVEG 3213 and CVEG 3223. (Typically offered: Irregular)

CVEG 5293. Water Reuse. 3 Hours.

CVEG 5293 is a graduate-level course that discusses topics related to water reclamation and reuse. Topics include past and current practices of water reuse, health and environmental issues related to water reuse, water technologies and systems for water reuse, and water reuse applications. Prerequisite: CVEG 3243 or equivalent course. (Typically offered: Spring Even Years)

CVEG 5303. Theory of Stability. 3 Hours.

Study of structural members subjected to compression. Analysis of compression members considering support conditions and within frame configurations. Analysis of beams considering lateral torsional bucking. AISC Steel Manual strength equations related to columns and beams are derived and discussed. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5313. Matrix Analysis of Structures. 3 Hours.

Energy and digital computer techniques of structural analysis as applied to conventional forms, space trusses, and frames. Prerequisite: CVEG 3303 or graduate standing. (Typically offered: Irregular)

CVEG 5323. Structural Dynamics. 3 Hours.

Dynamics response of single and multidegree of freedom systems. Modal analysis. Response spectra. Computer programs for dynamic analysis. Design considerations for structures subjected to time-varying forces including earthquake, wind, and blast loads. Prerequisite: CVEG 3303. (Typically offered: Irregular)

CVEG 5333. Concrete Materials. 3 Hours.

Topics include portland cement production, supplementary cementing materials, fresh and hardened concrete properties, mixture proportioning, chemical admixtures, curing, and specialty concretes. Corequisite: Lab component. Prerequisite: CVEG 4303. (Typically offered: Irregular)

CVEG 5343. Highway Bridges. 3 Hours.

Economics of spans, current design and construction specifications, comparative designs. Possible refinements in design techniques and improved utilization of materials. Prerequisite: CVEG 4313 and CVEG 4303. (Typically offered: Irregular)

CVEG 5353. Prestressed Concrete Design. 3 Hours.

Analysis and design of prestressed concrete beams. Topics include flexural analysis, prestress bond, draping and debonding, allowable stresses, shear analysis and design, camber prediction, and prestress losses. Prerequisite: CVEG 4303. (Typically offered: Irregular)

CVEG 5363. Advanced Topics in Reinforced Concrete. 3 Hours.

Analysis and design of reinforced concrete members. Topics include slender columns, one-way and two-way slab design, strut and tie design, and torsion. Prerequisite: CVEG 4303 or graduate standing. (Typically offered: Irregular)

CVEG 5373. Advanced Structural Steel Design. 3 Hours.

Design of structural steel components using the Load and Resistance Factor Design method. Intensive treatment of simple and eccentric connections, composite construction, plate girders, and plastic analysis and design. Prerequisite: CVEG 4313 or graduate standing. (Typically offered: Irregular)

CVEG 5383. Finite Element Methods in Civil Engineering. 3 Hours.

An understanding of the fundamentals of the finite element method and its application to structural configurations too complicated to be analyzed without computer applications. Application to other areas of civil engineering analysis and design such as soil mechanics, foundations, fluid flow, and flow through porous media. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5393. Advanced Strength of Materials. 3 Hours.

The course will continue from the basic material addressed in the undergraduate course and investigate in more detail stress analysis as it pertains to civil engineering type problems. Topics addressed in the course will include stress analysis (two-dimensional), constitutive relationships, solutions for two-dimensional problems, flexure, torsion, beams on elastic foundations, and energy methods. Prerequisite: CVEG 2023 or MEEG 3013. (Typically offered: Irregular)

CVEG 5413. Transportation and Land Development. 3 Hours.

Study of interaction between land development and the transportation network. Application of planning, design, and operational techniques to manage land development impacts upon the transportation system, and to integrate land layout with transportation network layout. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5423. Structural Design of Pavement Systems. 3 Hours.

An introduction to the structural design of pavement systems including: survey of current design procedures; study of rigid pavement jointing and reinforcement practices; examination of the behavioral characteristics of pavement materials and of rigid and flexible pavement systems; introduction to structural analysis theories and to pavement management concepts. Prerequisite: CVEG 4433. (Typically offered: Irregular)

CVEG 5433. Traffic Engineering. 3 Hours.

A study of both the underlying theory and the use of traffic control devices (signs, traffic signals, pavement markings), and relationships to improved traffic flow and safety, driver and vehicle characteristics, geometric design, and societal concerns. Also includes methods to collect, analyze, and use traffic data. Prerequisite: CVEG 3413 or graduate standing. (Typically offered: Irregular)

CVEG 5463. Transportation Modeling. 3 Hours.

The use of mathematical techniques and/or computer software to model significant transportation system attributes. May compare model results with actual measured traffic attributes, using existing data sources and/or collecting and analyzing field data. Pre- or Corequisite: Lab component. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5503. Construction Safety. 3 Hours.

Construction industry safety management systems, practices, and research to prevent injuries on work sites. Roles, responsibilities, and interaction of construction industry participants in safety management. OSHA organization, regulation framework, and resources. Safety program procedures and practices associated with positive safety performance outcomes. Total cost of injuries to include personal, direct/indirect costs, and workers compensation insurance. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5513. Construction Scheduling. 3 Hours.

Develop an understanding of modern scheduling techniques used for the management of construction projects. Learn the underlying logical principles, calculation methods, and presentation formats for PDM, the most prevalent technique. Load schedules with resources and costs to enable leveling, smoothing, and earned value analysis. Learn to update schedules for actual progress, identify problems, and compress or crash activities. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5523. Construction Productivity. 3 Hours.

This course introduces the student to construction industry productivity measurement, management practices, planning processes, and work methods to improve labor productivity on project sites. Factors that influence labor productivity such as resource supply chain, rework, changes, craft labor motivation, and the workforce environment are included. Roles, responsibilities, and interaction of construction industry participants in productivity management will be examined. Participants will learn construction productivity improvement program tools associated with improved productivity performance including work sampling and activity analysis. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5533. Legal Aspects of Construction. 3 Hours.

Students will identify legal issues in the course of a construction project and learn to determine when and where they or their employers or clients need legal advice. The course covers the most common legal considerations and disputes that arise in the construction and design industries from the perspectives of different industry participants, and it explores the most important contractual terms commonly used in construction industry agreements. The individual lessons address basic aspects of the legal system, liability for negligence and professional malpractice, and a full range of legal risk allocation and risk management strategies, relating to: bidding and proposal practices; project delivery systems; contracting practices; insurance; surety bonds; pricing, scheduling, and payment disputes; contract administration; legal remedies; and alternative dispute resolution methods. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5543. Sustainability in Construction Management. 3 Hours.

Sustainability in Construction Management will explore traditional concepts of construction management through the lens of sustainability. Topics covered will include elements of sustainable design and construction, sustainable project requirements and management, choosing materials and production, sustainability design and construction economics, understanding specifications, community participation, waste management, regulatory agencies, and worker safety and roles. These topics will be viewed through the lens of the three pillars of sustainability: economics, environmental, and social. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5553. Risk and Financial Management in Construction. 3 Hours.

This course prepares students to understand the differences between financial management in a construction company versus financial management in other industries. The course will also teach students how to account for a construction company's financial resources. The students will then learn how to quantitatively analyze financial decisions. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CVEG 5563. Building Information Modeling (BIM) for Design and Construction. 3 Hours.

This course provides students with a comprehensive overview of building information modeling (BIM) within the context of multiple project delivery methods and from the different perspectives of owners, architects/engineers and contractors/subcontractors. The course includes 'hands-on' experiences using BIM software (Autodesk Revit) and will provide students with a basic working knowledge of the software. The curriculum also covers a systems perspective of how BIM works in different contractual relationships and workflows. Finally, the course will provide students with an understanding of how to implement BIM for companies that have not already done so. The course culminates with a student-modeled project in BIM, in conjunction with a real-world example in how your company can implement BIM. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CVEG 562V. Research. 1-6 Hour.

Fundamental and applied research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CVEG 563V. Special Problems. 1-6 Hour.

Special problems in CVEG. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CVEG 5863. Fundamentals of Sustainability in Civil Engineering. 3 Hours.

Qualify and quantify the economic, environmental, societal and engineering drivers behind sustainability in Civil Engineering. Justification of the feasibility and benefits of sustainability in environmental, geotechnical, structural and transportation through verbal and written communications. Students cannot receive credit for both CVEG 4863 and CVEG 5863. Prerequisite: Graduate standing or instructor consent. (Typically offered: Irregular)

CVEG 5953. Fundamentals of Fracture and Fatigue in Structures. 3 Hours.

The course will cover the concepts of linear-elastic, elastic-plastic and time-dependent Fracture Mechanics as applied to fracture in a variety of materials, structures, and operating conditions. The examples will include fracture in large components such as aircraft, bridges and pressure vessels and also in bones and in soft materials and human tissue. Prerequisite: Graduate standing in Civil, Mechanical or Biomedical Engineering or consent of the instructor. (Typically offered: Fall)

This course is cross-listed with BMEG 5953, MEEG 5953.

CVEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CVEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Clinton School of Public Service (UACS)

James L. "Skip" Rutherford
William J. Clinton Professor and Dean
Sturgis Hall, 1200 President Clinton Avenue
Little Rock, Arkansas 72201
Phone: 501-683-5200
Fax: 501-683-5210
Email: srutherford@clintonschool.uasys.edu
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Susan A. Hoffpauir
Professor and Associate Dean
Sturgis Hall, 1200 President Clinton Avenue
Little Rock, Arkansas 72201
Phone: 501-683-5200
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Clinton School of Public Service Website (<http://www.clintonschool.uasys.edu/>)

Degree Conferred:

Master of Public Service (M.P.S.)

The Master of Public Service degree is offered at the University of Arkansas Clinton School in Little Rock, Arkansas, in collaboration with the University of Arkansas, the University of Arkansas at Little Rock, and the University of Arkansas for Medical Sciences. For a description of the program, admission and degree requirements, please see the Clinton School's Web site at <http://www.clintonschool.uasys.edu>.

Clinton School courses will be interactive, making extensive use of problem-based formats and employing instructional technology as needed. The classes will also have access to speakers and public leaders who visit the Clinton Presidential Library for special events.

Bavon, AI, Ph.D., M.S. (Florida State University), Professor, 2008.

DiPippa, Nikolai Shiro, B.S. (Hendrix College), Instructor, 2006.

Fitzpatrick, Ellen Therese, Ph.D. (Michigan State University), Professor, 2012.

Hoffpauir, Susan Annette, Ph.D. (University of Michigan-Ann Arbor), Distinguished Professor, 2011.

Standerfer, Christina Corrado, Ph.D. (University of Colorado-Boulder), M.A., B.A. (University of Arkansas at Little Rock), Professor, 2007.

Williams, Charlotte Lewellen, Ph.D., M.S. (University of Arkansas for Medical Sciences), B.S. (Howard University), Professor, 2007.

Courses

UACS 502V. Advanced Problems in Public Service. 1-3 Hour.

Provides an opportunity for individual study. (Typically offered: Irregular)

UACS 5101. Ethical and Legal Dimensions of Public Service. 1 Hour.

This course will provide an overview of the primary ethical principles and legal concepts that guide difficult decisions in the public realm. Traditional academic study of ethical and legal theory will be combined with practical approaches to problem solving. Students will explore issues of economic, political, and social justice through case studies of current issues. Students will construct cases that are relevant to their own fields and present them to the class, identifying ethical and legal constraints on decision-making and implementation. (Typically offered: Irregular)

UACS 5303. Communication Processes and Conflict Transformation. 3 Hours.

The course is designed to increase the student's personal communication effectiveness as a leader and public servant, and to enable students to understand the application of communication processes in the public arena. (Typically offered: Irregular)

UACS 5313. Dynamics of Social Change. 3 Hours.

The course deals with the elements of social change in a democratic society, and how these intersect with and are affected by economic and political forces. A critical examination of the various justifications for promoting or discouraging social change will be undertaken, and the inherent strengths and weaknesses of these various approaches will be analyzed. Real-world cases will be used, and a culminating exercise will be a strategic assessment of the Lower Mississippi Delta. (Typically offered: Irregular)

UACS 5323. Leadership in Public Service. 3 Hours.

This course is designed to increase students' knowledge of leadership concepts and best practices, provide opportunities and experiences that improve leadership skills and techniques, and enhance capabilities in organizational management. Students will assess their leadership strengths and weaknesses, as well as develop an action plan to match their career goals. They will improve knowledge and skills in building diverse teams, in initiating/managing change, in addressing uncertainty, and in leading non-governmental organizations. At the end of the course, students should be able to design leadership strategies to successfully address a spectrum of issues in public service and in promoting the community good. (Typically offered: Irregular)

UACS 5333. Analysis for Decision Making In Public Service. 3 Hours.

This course is intended to provide students with analytical tools that enhance their skills in diagnosing problems and formulating solutions within organizations and communities. Instruction will focus on evaluating community assets as a balance to assessing community need. Underlying values of social justice and collaborative problem-solving provide a benchmark for these activities. Students, working in teams, will be challenged to apply their skills to cases related to affordable housing and homelessness. (Typically offered: Irregular)

Communication (COMM)

Robert Brady
Department Chair
417 Kimpel Hall
479-575-3046

Ryan Neville-Shepard
Graduate Coordinator
515 Kimpel Hall
479-575-5962
Email: rnevshp@uark.edu

Department of Communication Website (<http://fulbright.uark.edu/departments/communication/>)

Degree Conferred:

M.A. (COMM)

Program Description: Communication with specific emphasis in civic engagement. We define civic engagement broadly, but seek to study and use communication to create more inclusive organizations, more resilient communities, and more informed and engaged citizens.

Primary Areas of Faculty Research: Film; media; rhetoric; organizational, environmental, health, interpersonal, intercultural and political issues using interpretive, quantitative, rhetorical and critical lenses.

M.A. in Communication

Prerequisites to Degree Program: A student entering graduate studies should have a minimum of 24 semester hours in undergraduate credit within the area of communication or closely related studies. Prospective students must supply: 1) three letters of recommendation (preferably from professors who can comment on their ability to do graduate-level work) and 2) their GRE examination scores through the Graduate School application portal. They must send 3) an essay-length writing sample (preferably an essay or research paper written for a class) and 4) a statement of their goals for graduate study in Communication at the University of Arkansas directly to the Communication Department's Graduate Coordinator.

Requirements for a Master of Arts Degree: A minimum of 30 semester hours in graduate-level courses plus the capstone course (3 hours)

or 27 hours of course work and a thesis (6 hours). The following departmental requirements must be met by students pursuing the M.A. in Communication:

1. Completion of the COMM 5163 Introduction to Communication Paradigms during their first semester of resident graduate study in which it is offered.
2. Two graduate courses in communication research methods taken in their first year of graduate study and selected from the following: COMM 5173 Qualitative Methods in Communication, COMM 5123 Quantitative Research Methods in Communication, or COMM 5183 Interpretive Research Methods in Communication.
3. Either three hours of capstone project credit (COMM 5923 Capstone Course in Communication) **or** six hours of thesis credit (COMM 600V Master's Thesis). Each student must complete and successfully defend either a capstone project or an M.A. thesis.
4. In addition to the Paradigms class, the two required methods courses, and the selected exit option (i.e., thesis or capstone course), at least four three-hour 5000-level courses must be completed in the Department of Communication. At least three of these courses should be in one focal area of civic engagement.
5. The remaining hours of graduate credit must be selected from the following options:
 - a. Additional 5000-level departmental seminars;
 - b. Up to six hours of graduate-level courses outside the department that directly relate to the student's plan of study;
 - c. Three hours of internship credit in COMM 5913 Internship in Communication;
 - d. Up to six hours of credit in COMM 590V Special Problems.

Students should also be aware of Graduate School requirements with regard to master's degrees (<http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext>).

Graduate Faculty

Allen, Myria, Ph.D., M.A., B.A. (University of Kentucky), Professor, 1993.
Aloia, Lindsey S., Ph.D. (Pennsylvania State University), M.A. (University of Delaware), B.A. (College of New Jersey), Associate Professor, 2017.
Amason, Trish, Ph.D. (Purdue University), M.A. (University of Kentucky), B.S.E. (University of Arkansas), Associate Professor, 1994.
Brady, Robert M., Ph.D. (University of Michigan-Ann Arbor), M.A. (Western Kentucky University), B.S. (Murray State University), Associate Professor, 1979.
Butcher, Margaret, Ph.D. (University of Missouri), M.A., B.S. (Arkansas State University), Teaching Assistant Professor, 2015.
Catron-Ping, Peggy Lee, Ed.D. (University of Arkansas), M.A. (Missouri State University), Instructor, 2004.
Corrigan, Lisa, Ph.D., M.A. (University of Maryland-College Park), B.A. (University of Pittsburgh), Professor, 2007.
Guan, Mengfei, Ph.D. (University of Georgia), M.A. (University of Alabama), B.A. (Ocean University of China), Assistant Professor, 2019.
Hatfield, Joe, Ph.D. (University of Colorado Boulder), M.A. (Syracuse University), B.A. University of North Texas, Assistant Professor, 2020.
Jennings, Freddie, Ph.D. (University of Missouri), M.A., B.A. University of Arkansas), Visiting Assistant Professor, 2018.
Jones, Richard E., M.F.A. (Miami University), Assistant Professor, 2020.
Jones, Ringo, M.F.A. (Miami University), B.A. (Northern Kentucky University), Teaching Assistant Professor, 2016.
Meade, Lynn, Ed.D., M.A. (University of Arkansas), Instructor, 2004.

Neville-Shepard, Meredith D., Ph.D. (University of Kansas), M.A. (University of Kansas), B.A. (Furman University), Teaching Assistant Professor, 2016.

Neville-Shepard, Ryan M., Ph.D. (University of Kansas), M.A. (University of Kansas), B.A. (Bates College), Assistant Professor, 2016.

O'Loughlin, J. Brian, Ph.D. (University of Alabama), M.A. (Syracuse University), B.S. (Boston College), Visiting Assistant Professor, 2016.

Rosteck, Thomas, Ph.D. (University of Wisconsin-Madison), M.A. (Brown University), A.B. (Washington University), Associate Professor, 1990.

Scheide, Frank Milo, Ph.D. (University of Wisconsin-Madison), M.A. (New York University), B.S. (University of Wisconsin-River Falls), Professor, 1977.

Schulte, Stephanie Ricker, Ph.D., M.A. (George Washington University), B.A. (University of Arkansas), Associate Professor, 2008.

Spialek, Matthew L., Ph.D. (University of Missouri), Assistant Professor, 2017.

Warren, Ron, Ph.D. (Indiana University), M.A. (Colorado State University), B.A. (Michigan State University), Associate Professor, 1997.

Wicks, Robert Howard, Ph.D. (Michigan State University), M.A. (University of Missouri-Columbia), B.A. (American University), Professor, 1994.

Zhu, Yaguang, M.F.A. (University of Nebraska), Assistant Professor, 2019.

Courses

COMM 5111. Colloquium in Communication Research. 1 Hour.

Presentation, evaluation, and discussion of research proposals or on-going research projects. Graduate students are required to register for this course each semester of residence. (Typically offered: Fall and Spring) May be repeated for degree credit.

COMM 5123. Quantitative Research Methods in Communication. 3 Hours.

Emphasizes the assumptions and procedures of social scientific research methods in communication. (Typically offered: Fall)

COMM 5133. Media Processes & Effects. 3 Hours.

Introduction to scholarly research and theory in media processes and effects. Particular attention will be devoted to the impact of media messages on individuals and societies. Emphasis will be placed on the construction and development of theory. (Typically offered: Fall)

COMM 5163. Introduction to Communication Paradigms. 3 Hours.

Introduces the variety of modes of inquiry used in communication. Reviews the field's history and boundaries. Explores contemporary communication research. (Typically offered: Fall)

COMM 5173. Qualitative Methods in Communication. 3 Hours.

Emphasizes the assumptions and procedures of qualitative research methods in the examination of human communication behavior. (Typically offered: Spring)

COMM 5183. Interpretive Research Methods in Communication. 3 Hours.

Examines various perspectives used to analyze and critique various texts (e.g., media programming, speeches). (Typically offered: Spring)

COMM 5193. Seminar in Communication. 3 Hours.

Research, discussion, and papers focus on one of a variety of communication topics including symbolic processes in communication, philosophy of rhetoric, communication education, criticism of contemporary communication, interpersonal communication, organizational communication, and contemporary applications of rhetoric. Maximum credit is 9 semester hours. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

COMM 5323. Seminar in Persuasion. 3 Hours.

Focus is on comparing theoretical accounts of persuasion and research evidence concerning the effects of various factors on persuasion. (Typically offered: Fall)

COMM 5333. Interpersonal Communication Theory. 3 Hours.

Survey of the theoretical orientations in interpersonal communication with primary focus on conceptual, philosophical and research issues. (Typically offered: Fall Even Years)

COMM 5343. Interpersonal Communication. 3 Hours.

Theory and research concerning the exchange of information and the mutual influencing of behavior among people. Prerequisite: Graduate standing. (Typically offered: Fall)

COMM 5353. Rhetorical Criticism. 3 Hours.

A seminar in rhetorical criticism. A study of the development of standards of rhetorical appraisal from the foundations of the art of speaking to the modern period; examination of contemporary approaches to rhetorical appraisal and practice in critical analysis of contemporary address. (Typically offered: Irregular)

COMM 5373. Content Analysis. 3 Hours.

Techniques for observing and analyzing the overt communication behavior of selected communicators. Prerequisite: Graduate standing. (Typically offered: Irregular)

COMM 5383. Seminar in Political Communication. 3 Hours.

Research seminar focusing on selected topics such as candidate imagery, diffusion of political information, or political symbolism. Prerequisite: Graduate standing. (Typically offered: Irregular)
This course is cross-listed with PLSC 5383.

COMM 5403. Organizational Communication Theory. 3 Hours.

A seminar on the historical development of theory and research into communication processes occurring within an organizational setting. Lecture, discussion, oral and written reports. Prerequisite: Graduate standing. (Typically offered: Irregular)

COMM 5463. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall)
This course is cross-listed with WLLC 5463, ANTH 5473, ENGL 5463.

COMM 5473. Treatment of Native Americans in Film. 3 Hours.

Compares the treatment of Native Americans in film with how representatives of this group identify themselves. Will also focus on motion pictures relating to Native Americans produced by indigenous filmmakers. (Typically offered: Irregular)

COMM 5503. Communication and Cultural Studies. 3 Hours.

Examinations of the role of communication in modern culture. Emphasis is upon the production and circulation of meanings with society, and special attention is given to the role of popular and mass media in this process. Prerequisite: Graduate standing. (Typically offered: Fall)

COMM 5513. Sustainability and Communication. 3 Hours.

Communication's role in creating and conveying an organization's environmental sustainability philosophy and initiatives. Discusses internal communication when establishing and communicating sustainability goals and initiatives. Covers communicating sustainability to external groups through websites, sustainability reports, and advocacy initiatives. For profit, nonprofit, governmental, NGOs, and/or advocacy organizations discussed. (Typically offered: Fall Even Years)

COMM 5533. Family Communication. 3 Hours.

An exploration of the major theories and lines of research that examine family communication in contemporary American life. (Typically offered: Fall Even Years)

COMM 569V. Seminar in Film Studies. 1-3 Hour.

Research, discussion; papers on a variety of film genres and areas including the new American film, the science-fiction film, directors, film comedy, the experimental film, criticism, and the film musical. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

COMM 5763. Health Communication. 3 Hours.

Examines the difficulties of effective communication between health care providers and recipients including the following: issues of social support, conveying bad news, cultural issues, and identifying relevant communication skills associated with effective health care provision. Explores medical education models for training in effective patient-provider communication. (Typically offered: Irregular)

COMM 5823. Political Communication. 3 Hours.

Covers contemporary political communication theory and applies them to understand modern political campaigns. Topics covered include the rhetoric of politics, political advertising, the role of the media and public opinion, the impact of new technology, campaign speech genres, political debates, and the role of social identity in presidential campaigns. (Typically offered: Irregular)

COMM 5833. The Rhetoric of the Modern American Presidency. 3 Hours.

Study contemporary presidents' reliance on public persuasion, especially in efforts to bypass Congress and accomplish complicated political goals. Explore the origins of the concept of the 'rhetorical presidency,' specifically how it developed and changed the nature of the executive branch of government. Examine major genres of modern presidential rhetoric illustrating that trend. (Typically offered: Irregular)

COMM 5843. Legal Communication. 3 Hours.

Examines communication processes in the legal environment and focuses on communication skills and behaviors among judges, attorneys, litigants, and jurors. Particular attention will be given to verbal strategies and nonverbal messages related to interviews, negotiation, mediation, and litigation and to the rhetorical functions of legal pleadings and judicial opinions. (Typically offered: Irregular)

COMM 5853. American Film Survey. 3 Hours.

A survey of major American film genres, major directors and films that have influenced the development of motion pictures. (Typically offered: Fall and Summer)

COMM 5863. History and Development of International Film I. 3 Hours.

A critical survey of international film as a distinctive art form and as a medium of expression and communication with attention given to films and cinema from its origins to 1975. (Typically offered: Irregular)

COMM 5873. History and Development of International Film II. 3 Hours.

A critical survey of international film as a distinctive art form and as a medium of expression and communication with attention given to films and cinema from 1975 to the present. (Typically offered: Irregular)

COMM 590V. Special Problems. 1-6 Hour.

Credit by arrangement. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

COMM 5913. Internship in Communication. 3 Hours.

Internship in applied communication within public and private organizations. Prerequisite: 15 hours graduate level communication in residence. (Typically offered: Fall, Spring and Summer)

COMM 5923. Capstone Course in Communication. 3 Hours.

Students organize and synthesize knowledge developed throughout their graduate coursework into a tangible capstone product which becomes part of their professional portfolio. (Typically offered: Fall, Spring and Summer)

COMM 5993. Readings In Cultural Studies. 3 Hours.

Classic and current theoretical approaches to cultural studies. Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular)

COMM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

Communication Sciences and Disorders (CDIS)

Michael Hevel

Department Head, Rehabilitation, Human Resources and Communication Disorders

100 Graduate Education Building

479-575-4758

Email: hevel@uark.edu

Rachel Glade

Program Director

262 Epley Center for Health Professions

479-575-3575

Email: rglade@uark.edu

Communication Sciences and Disorders Website (<http://cdis.uark.edu/>)

Degrees Conferred:

M.S. in Communication Sciences and Disorders (CDIS)

The Master of Science (M.S.) degree program in communication disorders with an emphasis on speech-language pathology at the University of Arkansas is accredited by the Council on Academic Accreditation (CAA) in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700.

M.S. in Communication Sciences and Disorders

Prerequisites to Degree Program: Applicants to the M.S. degree in communication sciences and disorders with an emphasis in speech-language pathology are expected to have completed prerequisite course work in normal speech, language, and hearing functions, normal development, and speech-language and hearing disorders, as well as biological and physical sciences, behavioral and social sciences, and mathematics. Prospective applicants with undergraduate degrees in other disciplines should contact the Program Adviser for further information. To be considered for admission to graduate study in communication sciences and disorders, applicants must have a minimum overall GPA of 3.00 in undergraduate course work and must submit transcripts of all college-level coursework, a personal statement, and three letters of recommendation from persons competent to judge the applicant's potential for graduate studies. All applicants must submit scores from the Graduate Record Examination for full consideration. Students are only accepted for Fall admission. The application deadline is January 15 and must be completed using the CSDCAS centralized electronic application process (see the Communication Sciences and Disorders website (<http://cdis.uark.edu/>) for details). Incomplete and/or late applications will not be considered. Admission decisions are based on demonstrated graduate potential as well as best fit for the program

Requirements for the Master of Science Degree: The M.S. degree program in communication sciences and disorders is designed to ensure that all degree candidates meet the minimum academic and clinical practicum requirements for the Certificate of Clinical Competence in Speech-Language Pathology of the American Speech-Language-Hearing Association (ASHA). The degree program requires a minimum of five academic semesters to complete, including continuous enrollment in the summer session between the first and second years. Thesis and

non-thesis options are available. All candidates for the M.S. degree are required to pass a written comprehensive examination.

The program requires 36 hours of graduate-level academic credit and 15 hours of graduate-level clinical credit for the M.S. in Communication Sciences and Disorders. Required courses, clinical courses, and electives are listed below.

Required Core Courses (27 hours)

CDIS 5103	Research Methodology in Communication Disorders	3
CDIS 5121L	Feeding and Swallowing Disorders Lab	1
CDIS 5122	Feeding and Swallowing Disorders	2
CDIS 5213	Voice and Resonance Disorders	3
CDIS 5223	Fluency Disorders	3
CDIS 5233	Speech Sound Disorders	3
CDIS 5243	Language Disorders in Adults	3
CDIS 5253	Motor Speech Disorders	3
CDIS 5273	Language, Learning and Literacy	3
CDIS 5293	Augmentative and Alternative Communication	3
Clinical Courses (15 hours)		
CDIS 5183	Advanced Clinical Practicum I	3
CDIS 5283	Advanced Clinical Practicum II	3
CDIS 5383	Advanced Clinical Practicum III	3
CDIS 5443	Advanced Clinical Practicum IV	3
CDIS 5663	Advanced Clinical Practicum V	3
CDIS Graduate-Level Electives		9
Total Hours		51

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Graduate Faculty

Bowers, Andrew L., Ph.D. (University of Tennessee Health Science Center), M.A., B.A. (University of Tennessee), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2012.

Bowers, Lisa Marie, Ph.D. (University of Tennessee Health Science Center), M.A., B.A. (Louisiana State University), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2012.

Frazier, Kimberly Frances, Ph.D. (University of South Carolina–Columbia), M.S., B.S.E. (University of Arkansas), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2007.

Gilbertson, Margie, Ph.D. (University of Memphis), M.S.E., B.A. (University of Central Arkansas), Clinical Instructor, Department of Rehabilitation, Human Resource and Communication Disorders, 2016.

Glade, Rachel E., Ph.D. (University of Arkansas), M.S. (University of Arkansas for Medical Sciences), M.A. (University of Arkansas), B.S. (University of Arkansas at Little Rock), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2015.

Haghighi, Mohammad, Ph.D. (Ohio University), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2019.

Hagstrom, Fran W., Ph.D. (Clark University), M.S. (University of Texas Health Science Center-Houston), M.A. (St. Louis University), B.A. (Southwest Baptist University), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2002.

Holyfield, Christine E., Ph.D. (Pennsylvania State University), M.A. (University of Kansas), B.S. (Central Michigan University), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2017.

Perry, Kim, M.S. (University of Arkansas), Instructor, Department of Rehabilitation, Human Resource and Communication Disorders, 2007.

Courses

CDIS 5103. Research Methodology in Communication Disorders. 3 Hours.

An examination of methods of research in speech-language pathology and audiology and of the use of bibliographic tools. Focuses on purposes and problems of various forms of communication disorders research, procedures and instruments employed, and reporting of research. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5113. Seminar in Early Intervention. 3 Hours.

Study of a family-centered, transdisciplinary approach to early intervention with infants and toddlers at-risk for communication disorders. Topics include early communication development, service delivery in a family context, coordination with other disciplines, legislation mandating services, and providing services to children with multiple disabilities. Prerequisite: CDIS 3223 or equivalent, and graduate standing. (Typically offered: Spring)

CDIS 5121L. Feeding and Swallowing Disorders Lab. 1 Hour.

Observation and interpretation of techniques used for assessment and remediation of feeding and swallowing disorders in children and adults. Prerequisite: Enrollment in CDISMS program or Instructor Consent. (Typically offered: Fall)

CDIS 5122. Feeding and Swallowing Disorders. 2 Hours.

Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children and adults. Prerequisite: Enrollment in CDISMS program or Instructor Consent. (Typically offered: Fall)

CDIS 5143. Cognitive-Communication Development and Disorders. 3 Hours.

Study of normal cognitive development, the role of communication in this development, and shifts that may occur in conjunction with various speech, language and/or hearing disorders. Prerequisite: CDIS 3223. (Typically offered: Fall)

CDIS 5153. TBI and Right-Hemisphere Disorders. 3 Hours.

Study of the speech and language disorders commonly resulting from traumatic brain injury and right hemisphere disorders. Prerequisite: Enrollment in CDISMS program or instructor consent. (Typically offered: Spring)

CDIS 5173. Sign Language and Deafness. 3 Hours.

(Formerly CDIS 4103.) An introduction to American Sign Language (ASL) and the Deaf Community that uses it. This class will study expressive and sign language skills using ASL vocabulary, structure and grammar. The Deaf Community will be studied through videotapes and readings. Issues in Deaf Education will also be introduced. Graduate degree credit will not be given for both CDIS 4103 and CDIS 5173. (Typically offered: Fall, Spring and Summer)

CDIS 5183. Advanced Clinical Practicum I. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5203. Introduction to Aural Rehabilitation. 3 Hours.

(Formerly CDIS 4133.) Study of the technique used in the rehabilitation of speech and language problems of the hearing impaired including the role of amplification, auditory training, and speech reading in rehabilitation. Graduate degree credit will not be given for both CDIS 4133 and CDIS 5203. Prerequisite: CDIS 3103. (Typically offered: Spring)

CDIS 5213. Voice and Resonance Disorders. 3 Hours.

Study of disorders of phonation and resonance, including etiologies, diagnosis, and intervention strategies. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5223. Fluency Disorders. 3 Hours.

An examination of fluency disorders including theory, etiological factors, and development. In addition, the course is designed to address assessment and management of fluency disorders consistent with evidence-based practice for prospective speech-language pathologists. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5233. Speech Sound Disorders. 3 Hours.

Assessment and treatment of disorders in speech articulation. Prerequisite: Graduate standing. (Typically offered: Summer)

CDIS 5243. Language Disorders in Adults. 3 Hours.

Cognitive and communicative breakdown due to neurological trauma, including etiology, characteristics, assessment and treatment for aphasia, traumatic brain injury, and right hemisphere disorders. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 5253. Motor Speech Disorders. 3 Hours.

Study of motor speech production disorders related to damage to central or peripheral nervous system motor centers and pathways. Cerebral palsy, adult dysarthria, apraxia, and dysphagia are emphasized. Both theoretical and treatment considerations are addressed. Prerequisite: Enrollment in the Communication Sciences and Disorders Master of Science (CDISMS) program or instructor consent. (Typically offered: Spring)

CDIS 5263. Advanced Audiology. 3 Hours.

(Formerly CDIS 4263.) Study of the basic techniques used in audiological assessment of children and adults, including pure tone audiometry, speech audiometry, and special tests of hearing function. Graduate degree credit will not be given for both CDIS 4263 and CDIS 5263. Prerequisite: CDIS 3103. (Typically offered: Fall)

CDIS 5273. Language, Learning and Literacy. 3 Hours.

An examination of language-based literacy skills, including consideration of development, disorders, assessment and intervention. Prerequisite: Enrollment in CDISMS program or instructor consent. (Typically offered: Summer)

CDIS 5283. Advanced Clinical Practicum II. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing and CDIS 5183. (Typically offered: Spring)

CDIS 5293. Augmentative and Alternative Communication. 3 Hours.

Approaches to communication management with the severely and profoundly handicapped child or adult, with primary emphasis on augmentative and alternative communication assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5303. Clinical Assessment of Speech and Language Disorders. 3 Hours.

(Formerly CDIS 4183.) Study of the basic diagnostic procedures used in speech-language pathology. Emphasis is placed on the clinical processes of assessment, including criteria for test selection, techniques in test administration, and interpretation of test. Graduate degree credit will not be given for both CDIS 4183 and CDIS 5303. Pre- or Corequisite: Prior coursework in CDIS and ANTH 1023. (Typically offered: Spring)

CDIS 5313. Introduction to Speech and Hearing Science. 3 Hours.

(Formerly CDIS 4213.) Study of the acoustic structure of oral speech and the auditory skills underlying speech perception. Graduate degree credit will not be given for both CDIS 4213 and CDIS 5313. Prerequisite: CDIS 3203, CDIS 3213, CDIS 3124 and its lab component. Pre- or Corequisite: MATH 1203 or higher. (Typically offered: Spring)

CDIS 5323. Language Disorders in Children. 3 Hours.

(Formerly CDIS 4223.) Study of disorders of language acquisition and usage in children and adolescents, with emphasis upon the nature, assessment, and treatment of such disorders. Graduate degree credit will not be given for both CDIS 4223 and CDIS 5323. Prerequisite: CDIS 3223. (Typically offered: Spring)

CDIS 5353. Neurological Bases of Communication. 3 Hours.

(Formerly CDIS 4253.) A study of the structures and functions of the central and peripheral nervous systems as they relate to human speech, language, and cognition. Graduate degree credit will not be given for both CDIS 4253 and CDIS 5353. Prerequisite: Enrollment in the Communication Sciences and Disorders Master of Science (CDISMS) program or Instructor Consent. (Typically offered: Fall)

CDIS 5373. Communication Behavior and Aging. 3 Hours.

(Formerly CDIS 4273.) Study of the effects upon communication of normal aspects of the aging process, from early adulthood throughout the lifespan. Changes in speech, language, and hearing functioning are identified; common alterations in communicative disorders commonly associated with advanced age are discussed. Graduate degree credit will not be given for both CDIS 4273 and CDIS 5373. (Typically offered: Fall)

CDIS 5383. Advanced Clinical Practicum III. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing and CDIS 5283. (Typically offered: Summer)

CDIS 5391. Clinical Practicum: Hearing Disorders. 1 Hour.

Practicum in audiology. (Typically offered: Fall, Spring and Summer)

CDIS 5443. Advanced Clinical Practicum IV. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing, CDIS 5183, CDIS 5283, and CDIS 5383. (Typically offered: Fall)

CDIS 548V. Off-Campus Practicum: Public School Site. 1-6 Hour.

Practicum activities in speech-language disorders in a public school setting. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CDIS 5511. Professional Issues I. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Fall)

CDIS 5521. Professional Issues II. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Spring)

CDIS 5531. Professional Issues III. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Fall)

CDIS 558V. Internship: Clinical Site. 3-6 Hour.

Field placement in approved clinical setting for clock hours in speech-language pathology assessment and treatment. Students in the master's program must enroll in a minimum of 3 credit hours of CDIS 558V or CDIS 578V during their last semester of graduate studies. Prerequisite: Graduate standing; Completion of one semester of either CDIS 548V or CDIS 568V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 5663. Advanced Clinical Practicum V. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 568V. Off-Campus Practicum: Clinical Site. 1-6 Hour.

Practicum activities in speech-language disorders in an off-campus clinical site. Prerequisite: Graduate standing, CDIS 5183, CDIS 5283, and CDIS 5383. (Typically offered: Fall, Spring and Summer)

CDIS 578V. Internship: Public School Site. 3-6 Hour.

Field placement in approved public school setting for clock hours in speech-language pathology assessment and treatment. Students in the Master's program must enroll in a minimum of 3 credit hours of CDIS 578V or CDIS 558V during their last semester of graduate studies. Prerequisite: Graduate standing; Completion of one semester of either CDIS 548V or CDIS 568V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 5813. Advanced Auditory (Re)Habilitation. 3 Hours.

This course provides students with an in-depth knowledge of hearing anatomy and physiology as well as current hearing and hearing assistive technologies. The development of auditory skills across the lifespan will be discussed as well as intervention techniques to facilitate auditory, speech, and spoken language skills across the lifespan. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5823. Language Learning with Multiple Disabilities. 3 Hours.

Approaches to services (assessment and intervention) for individuals who, as a result of multiple disabilities, are in the beginning stages of language development including the preintentional and presymbolic stages. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5843. Communication and Swallowing in Dementia. 3 Hours.

This course provides an in-depth examination of the communication and feeding/swallowing factors demonstrated by patients with dementia. Etiologies, symptoms, progression, evaluation, and appropriate interventions for of the most common forms of dementia are addressed. Prerequisite: Graduate standing. (Typically offered: Summer)

CDIS 5883. Policies & Procedures in Educational Speech-Language Pathology. 3 Hours.

Educational Speech Pathology is designed to familiarize the student the factors related to functioning as an SLP in an educational setting, including state and federal regulations/standards, service delivery considerations, eligibility criteria, and documentation. Prerequisite: Graduate Standing. (Typically offered: Summer)

CDIS 590V. Special Problems. 1-6 Hour.

Special problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 599V. Seminar in Professional Issues. 1-3 Hour.

Selected topics in professional issues in speech-language pathology and audiology. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

CDIS 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CDIS 6103. Literacy for Learning in Educational Settings. 3 Hours.

An examination of language-based literacy skills, including consideration of development, disorders, assessment, and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 6203. Advanced Assessment and Intervention for Fluency Disorders. 3 Hours.

An examination of fluency disorders including theory, etiological factors, and development. In addition, the course is designed to address assessment and management of fluency disorders consistent with evidence-based practice for prospective speech-language pathologists. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 6303. Effective Augmentative and Alternative Communication Services in Schools. 3 Hours.

This course will support current speech-language pathologists in becoming more effective speech-language pathologists as it relates to the provision of augmentative and alternative services in schools. Throughout this course, students will (a) identify a barrier they wish to address relevant to their current service provision or their current caseload, (b) discover strategies for addressing that barrier, and (c) develop a plan for improving their augmentative and alternative service provision through the implementation of those strategies in their own professional work. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 6403. Advanced Pediatric Feeding and Swallowing Assessment & Intervention. 3 Hours.

Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children. Prerequisite: Graduate standing. (Typically offered: Irregular)

CDIS 6503. Behavioral Management in Educational Settings. 3 Hours.

The course provides an introduction to behavioral management across a variety of settings highlighting best practices from organizing time, materials, and room space. Strategies for managing individual and large group student behaviors, transitions, and other arrangements will be presented in addition to basic federal and state laws as they pertain to the legal procedures for all professionals, including educators of students with disabilities and students who use English as a Second Language (ESL). Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 699V. Seminar in Communication Sciences and Disorders. 1-6 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

Community College Leadership (CCLE)

Michael Hevel
Department Chair
Rehabilitation, Human Resources and Communication Disorders
106 Graduate Education Building
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Degree Offered:

M.Ed. in Community College Leadership (CCLEME)

The Master of Education in Community College Leadership is an online 33-hour graduate program targeting individuals who work in community colleges and seek to build their content expertise and improve their career mobility. The overall goal of this program is to improve the preparation of community college employees that will correspondingly improve these institutions. The program is designed for individuals with a bachelor's degree and at least some experience working at a community college. Additionally, most students will bring a deep belief in the potential of community colleges to educate individuals and improve local communities.

Requirements for M.Ed. in Community College Leadership

Admission Requirements: Applicants must meet all requirements for admission to the University of Arkansas Graduate School, except the standardized test score requirement. In addition, applicants must have significant experiences with and preferably current employment at a community college. Applicants will be required to complete a Community College Leadership Program application form and submit two professional references, a résumé, and a statement of interest.

Program Requirements: In addition to completing 33 hours of coursework, all students in the Master of Education in Community College Leadership program are required to complete a written comprehensive examination. The examination will be embedded within CCLE 5103 Critical Issues in Community Colleges. Courses are offered online in an 8-week semester format, except in the summer.

Required Courses

CCLE 5003	History of the Community College	3
CCLE 5013	Legal Issues in Community Colleges	3
CCLE 5023	Organization and Leadership in Community Colleges	3
CCLE 5033	Diversity and Inclusion in Community Colleges	3

CCLE 5043	Finance and Fiscal Management in Community Colleges	3
CCLE 5053	Students in Community Colleges	3
CCLE 5063	Teaching and Learning in Community Colleges	3
CCLE 5073	Workforce and Economic Development in Community Colleges	3
CCLE 5083	Research and Assessment of Community Colleges	3
CCLE 5093	Program Planning in Community Colleges	3
CCLE 5103	Critical Issues in Community Colleges	3
Total Hours		33

Courses

CCLE 5003. History of the Community College. 3 Hours.

The course examines the history and development of community colleges in the United States. Prerequisite: Admission into M.Ed. in Community College Leadership program or instructor consent. (Typically offered: Irregular)

CCLE 5013. Legal Issues in Community Colleges. 3 Hours.

The course examines the legal issues facing community colleges in the United States, including: the rights and responsibilities of educators and students, fair employment; due process; torts liability and contracts; and federal and state legislation. Prerequisite: Admission into the M.Ed. program in community college leadership or instructor consent. (Typically offered: Irregular)

CCLE 5023. Organization and Leadership in Community Colleges. 3 Hours.

The course applies the scholarship of organizations and leadership to community colleges in the United States, covering issues related to governance and policymaking, management, problem-solving, and personnel. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5033. Diversity and Inclusion in Community Colleges. 3 Hours.

The course focuses on the responsibilities of community college leaders to be multiculturally competent professionals who foster inclusive practices for diverse student populations. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5043. Finance and Fiscal Management in Community Colleges. 3 Hours.

The course provides an understanding of community college finance and budgeting practices. Prerequisite: Admission into M.Ed. in Community College Leadership program or instructor consent. (Typically offered: Irregular)

CCLE 5053. Students in Community Colleges. 3 Hours.

The course provides an understanding of student populations in community colleges. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5063. Teaching and Learning in Community Colleges. 3 Hours.

The course examines instructional strategies and considers the diverse types of learning environments at community colleges. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5073. Workforce and Economic Development in Community Colleges. 3 Hours.

The course provides an overview of the role community colleges play in workforce, economic, and community development, including community-based partnerships, best practices in program development, and collaboration with both for-profit and nonprofit organizations. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5083. Research and Assessment of Community Colleges. 3 Hours.

The course provides an overview of research and assessment applicable to community colleges to inform strategic planning and data-driven decision-making. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5093. Program Planning in Community Colleges. 3 Hours.

The course introduces the process of program planning in community colleges, including various planning models used in academic settings and fundamental steps in the planning process. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

CCLE 5103. Critical Issues in Community Colleges. 3 Hours.

The course considers the pressing problems facing community colleges and strategies to maximize the potential of these institutions. Prerequisite: Admission into M.Ed. in Community College Leadership or instructor consent. (Typically offered: Irregular)

Comparative Literature and Cultural Studies (CLCS)

Luis Fernando Restrepo

Program Director

425 Kimpel Hall

479-575-7580

Email: lrestr@uark.edu

Comparative Literature and Cultural Studies Website (<https://fulbright.uark.edu/programs/comparative-literature-cultural-studies/index.php/>)

Degrees Conferred:

M.A., Ph.D. (CLCS)

Program Description: Established in 1958, the Comparative Literature and Cultural Studies Program is an innovative interdisciplinary graduate program for advanced studies in literature and culture across linguistic, national, disciplinary, and genre boundaries. Comparative Literature and Cultural Studies takes for granted that matters of everyday culture — popular culture as well as literary culture — are political matters in the way that power relations are established and sometimes challenged. The program offers advanced academic training in comparative literature, cultural studies, Hispanic studies, literary translation, and world language acquisition.

The program is supported primarily by the Departments of Communication, English, and World Languages, Literatures, and Cultures. The program also has affiliated faculty members in several programs and departments in the humanities and social sciences, including Anthropology, Art, Classics, Theatre, History, Philosophy, Sociology, Education, as well as interdisciplinary programs such as African and African American, Latin American and Latino, Middle Eastern, Indigenous, Jewish, and Gender Studies.

Primary Areas of Faculty Research: Literary theory and criticism, cultural studies, postcolonial studies, gender studies, visual discourses, world languages, literary translation.

M.A. in Comparative Literature and Cultural Studies

Admission to the Master of Arts Degree in Comparative Literature and Cultural Studies: The normal preparation for graduate study in comparative literature and cultural studies is an undergraduate degree in world languages, English, or a related field in the humanities and the social sciences. Applicants should have advanced proficiency in the intended languages of study. Admission requirements:

1. Application to the Graduate School
2. Complete official transcripts of all undergraduate and graduate work.

3. Graduate Record Examination (GRE) scores on the Aptitude Test (verbal, quantitative, and analytical writing).
4. International students are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exam, meeting the minimum score required by the Graduate School.
5. Statement of purpose describing academic interests and professional goals.
6. A Curriculum Vitae
7. An academic writing sample, demonstrating critical thinking, writing ability and research potential (10 pp approximately)
8. Three letters of recommendation

Requirements for the Master of Arts Degree in Comparative

Literature and Cultural Studies: In addition to the general requirements of the Graduate School, all master's candidates must meet the following requirements:

1. All master's candidates must take WLIT 5193 Introduction to Comparative Literature and COMM 5503 Communication and Cultural Studies
2. All master's candidates must take 6 hours of world languages and literatures in areas and historical periods different from their primary fields. All master's candidates are required to take and pass a comprehensive examination based on course work taken. Students may retake only once any examination they fail.
3. All master's candidates must demonstrate reading proficiency in a language other than English. The language requirement may be fulfilled either by taking 12 hours in the target language or by taking the reading exam administered by the Department of World Languages, Literatures, and Cultures. Documented coursework from an accredited institution in which the language of instruction is other than English may be used to substitute for a language exam.

Requirements of the Thesis Option

1. Candidates in the master's option must complete 30 hours of graduate course work and 6 thesis hours. Master's candidates intending to enter the Ph.D. program are recommended to choose the thesis option.
2. Candidates will take 6 hours of course work and 6 thesis hours in their primary area of concentration.
3. Candidates will take 12 hours of graduate course work in a second field (other literary tradition or cultural studies).
4. Master's candidates in the thesis option must present a thesis proposal early in their second year of study and must turn in the thesis during the last semester of course work, following Graduate School guidelines for thesis submission.
5. Theses in a language other than English. Students in the Comparative Literature and Cultural Studies Program may request permission to submit their thesis in a language other than English, with legitimate justification. Valid reasons for submitting a thesis in a language other than English includes the subject matter, special primary audience, publication venues, academic position in a foreign country, historical or literary value, and the documents to be used, analyzed and interpreted. Limited English writing skills is not a valid justification. Students must request approval of the target language from the thesis committee, the program advisory committee, the program director and the dean of the graduate school before starting the project. All committee members must be proficient in the target

language and approve target language usage. Abstracts must be written in English.

6. Candidates in the thesis option are only required to take the world literatures and cultures comprehensive exam.

Requirements for the Non-Thesis Option

1. In addition to the general requirements, Master's candidates in the non-thesis option must select two fields and complete 12 hours of graduate course work in each field (Arabic, Classics, English, French, German, Spanish, and courses in other disciplines in the humanities and the social sciences).
2. Candidates are required to take two comprehensive exams. One is on the specialty fields and one is on the selected areas of world literatures and cultures.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Ph.D. with Comparative Literature Concentration

Admission Requirements:

1. Application to the Graduate School
2. Complete official transcripts of all undergraduate and graduate work
3. Graduate Record Examination (GRE) scores on the Aptitude Test (verbal, quantitative, and analytical writing).
4. International students are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exams, meeting the minimum score required by the Graduate School.
5. Statement of purpose describing academic interests and professional goals. Doctoral applicants must specify which concentration they wish to pursue (comparative literature, cultural studies, Hispanic Studies, applied linguistics, or translation) and describe how their research interests might be met by working with specific members of our faculty
6. An academic writing sample preferably from a research or examination paper from a literature or culture course, showing evidence of critical thinking, writing ability and research skills
7. Three letters of recommendation from former instructors, employers, or supervisors

Requirements for the Doctoral Degree:

1. Ph.D. candidates must complete a minimum of 66 hours of graduate course work (including credit taken for the M.A. or M.F.A.) and must attain a 3.00 grade-point average in each of their fields. Part or all of the graduate course work completed at other U.S. institutions or accredited institutions abroad with a grade of "B" or higher and taken within seven years of starting the doctoral program may count towards the 66 hours requirement with the approval of the Program Advisory Committee. However, it should be noted that this course work will not be reflected on the student's transcript.
2. WLIT 5193 Introduction to Comparative Literature is required of all Ph.D. candidates in the Program in Comparative Literature and Cultural Studies.
3. Ph.D. candidates must take 24 hours in a main field. The goal is for the student to use this coursework to create a primary field of specialization.
4. Ph.D. candidates must complete 18 hours in one of the five doctoral concentrations –traditional comparative literature, cultural studies,

interdisciplinary Hispanic studies, translation, and world languages and applied linguistics—as described in detail below.

5. Ph.D. candidates must take 9 hours in world literatures and cultures outside their main field, providing historical depth and geographical breadth to their literary and cultural studies.
6. Ph.D. students must complete an additional 12 elective credits. They may use these to develop a tertiary field, strengthen primary or secondary fields, or to take courses outside those fields.
7. Ph.D. candidates must take 18 dissertation hours.
8. Ph.D. students must declare a concentration by the end of the first year and define a Dissertation Committee by the end of the second year. The committee consists of the student's research supervisor plus two other faculty members. This committee will administer the candidacy exam, the proposal defense, and the dissertation defense.
9. Ph.D. students must demonstrate reading proficiency in two languages other than English before being admitted into candidacy. The language requirements may be fulfilled either by completing 12 hours in the target language or by taking the reading exam administered by the Department of World Languages, Literatures, and Cultures. Documented coursework from an accredited institution in which the language of instruction is other than English may be used to substitute for a language exam.
10. Candidacy: Upon completion of coursework and world languages requirements, all Ph.D. students must take a two part candidacy exam and present a dissertation proposal.
11. The candidacy examination is based on a set of reading lists based on coursework and areas of concentration, that the student composes with the guidance of their advisor and committee members. The reading list is divided into five sections: two lists comprising the student's areas of concentration and three lists covering world literatures and cultures. The candidacy examination has two parts:
 - a. A written examination covering the student's world literatures and cultures fields;
 - b. A written examination covering the concentration areas of the reading lists.

Students may retake only once any examination they fail.

1. Dissertation Proposal: After successfully completing the candidacy examination, the Ph.D. student will submit a dissertation proposal to be discussed and approved in a formal meeting with the Dissertation Committee. This meeting is the proposal defense. A student failing a proposal defense may revise the proposal and retake the defense one time.
2. Dissertations in a language other than English. Students in the Comparative Literature and Cultural Studies Program may request permission to submit their dissertation in a language other than English, with legitimate justification. Valid reasons for submitting a dissertation in a language other than English includes the subject matter, special primary audience, publication venues, academic position in a foreign country, historical or literary value, and the documents to be used, analyzed and interpreted. Limited English writing skills is not a valid justification. Students must request approval of the target language from the dissertation committee, the program advisory committee, the program director and the dean of the graduate school before starting the project. All committee members must be proficient in the target language and approve target language usage. Abstracts must be written in English.

3. Upon passing both parts of the written examination as well as successfully completing the proposal defense, the student becomes a Ph.D. degree candidate and enters the dissertation stage.
4. Within the time limits specified by the Graduate School, each student must submit a dissertation acceptable to the student's dissertation committee.
5. Each student must pass a dissertation defense administered by the student's Dissertation Committee.

Requirements for the Comparative Literature Concentration

(CLIT): This concentration is for students interested in world literature and the intersections of different literary traditions beyond national borders.

Candidates will complete at least 18 hours in a second world language and literary tradition.

Requirements for Ph.D. with Cultural Studies Concentration

Admission Requirements:

1. Application to the Graduate School
2. Complete official transcripts of all undergraduate and graduate work
3. Graduate Record Examination (GRE) scores on the Aptitude Test (verbal, quantitative, and analytical writing).
4. International students are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exams, meeting the minimum score required by the Graduate School.
5. Statement of purpose describing academic interests and professional goals. Doctoral applicants must specify which concentration they wish to pursue (comparative literature, cultural studies, Hispanic Studies, applied linguistics, or translation) and describe how their research interests might be met by working with specific members of our faculty
6. An academic writing sample preferably from a research or examination paper from a literature or culture course, showing evidence of critical thinking, writing ability and research skills
7. Three letters of recommendation from former instructors, employers, or supervisors

Requirements for the Doctoral Degree:

1. Ph.D. candidates must complete a minimum of 66 hours of graduate course work (including credit taken for the M.A. or M.F.A.) and must attain a 3.00 grade-point average in each of their fields. Part or all of the graduate course work completed at other U.S. institutions or accredited institutions abroad with a grade of "B" or higher and taken within seven years of starting the doctoral program may count towards the 66 hours requirement with the approval of the Program Advisory Committee. However, it should be noted that this course work will not be reflected on the student's transcript.
2. WLIT 5193 Introduction to Comparative Literature is required of all Ph.D. candidates in the Program in Comparative Literature and Cultural Studies.
3. Ph.D. candidates must take 24 hours in a main field. The goal is for the student to use this coursework to create a primary field of specialization.
4. Ph.D. candidates must complete 18 hours in one of the five doctoral concentrations—traditional comparative literature, cultural studies, interdisciplinary Hispanic studies, translation, and world languages and applied linguistics—as described in detail below.

5. Ph.D. candidates must take 9 hours in world literatures and cultures outside their main field, providing historical depth and geographical breadth to their literary and cultural studies.
6. Ph.D. students must complete an additional 12 elective credits. They may use these to develop a tertiary field, strengthen primary or secondary fields, or to take courses outside those fields.
7. Ph.D. candidates must take 18 dissertation hours.
8. Ph.D. students must declare a concentration by the end of the first year and define a Dissertation Committee by the end of the second year. The committee consists of the student's research supervisor plus two other faculty members. This committee will administer the candidacy exam, the proposal defense, and the dissertation defense.
9. Ph.D. students must demonstrate reading proficiency in two languages other than English before being admitted into candidacy. The language requirements may be fulfilled either by completing 12 hours in the target language or by taking the reading exam administered by the Department of World Languages, Literatures, and Cultures. Documented coursework from an accredited institution in which the language of instruction is other than English may be used to substitute for a language exam.
10. Candidacy: Upon completion of coursework and world languages requirements, all Ph.D. students must take a two part candidacy exam and present a dissertation proposal.
11. The candidacy examination is based on a set of reading lists based on coursework and areas of concentration, that the student composes with the guidance of their advisor and committee members. The reading list is divided into five sections: two lists comprising the student's areas of concentration and three lists covering world literatures and cultures. The candidacy examination has two parts:
 - a. A written examination covering the student's world literatures and cultures fields;
 - b. A written examination covering the concentration areas of the reading lists.

Students may retake only once any examination they fail.

1. Dissertation Proposal: After successfully completing the candidacy examination, the Ph.D. student will submit a dissertation proposal to be discussed and approved in a formal meeting with the Dissertation Committee. This meeting is the proposal defense. A student failing a proposal defense may revise the proposal and retake the defense one time.
2. Dissertations in a language other than English. Students in the Comparative Literature and Cultural Studies Program may request permission to submit their dissertation in a language other than English, with legitimate justification. Valid reasons for submitting a dissertation in a language other than English includes the subject matter, special primary audience, publication venues, academic position in a foreign country, historical or literary value, and the documents to be used, analyzed and interpreted. Limited English writing skills is not a valid justification. Students must request approval of the target language from the dissertation committee, the program advisory committee, the program director and the dean of the graduate school before starting the project. All committee members must be proficient in the target language and approve target language usage. Abstracts must be written in English.
3. Upon passing both parts of the written examination as well as successfully completing the proposal defense, the student becomes a Ph.D. degree candidate and enters the dissertation stage.
4. Within the time limits specified by the Graduate School, each student must submit a dissertation acceptable to the student's dissertation committee.
5. Each student must pass a dissertation defense administered by the student's Dissertation Committee.

Requirements for the Cultural Studies Concentration (CULS). This concentration is for students interested inter and trans disciplinary approaches to study literature and culture, including non- literary genres such as mass media, popular culture, visual discourses, and communication theories. In addition to the other program requirements, students in the cultural studies concentration must complete 18 hours of coursework in an area related to cultural studies, including take COMM 5503 Communication and Cultural Studies and the seminar COMM 5993 Readings In Cultural Studies.

Ph.D. with Interdisciplinary Hispanic Studies Concentration

Admission Requirements:

1. Application to the Graduate School
2. Complete official transcripts of all undergraduate and graduate work
3. Graduate Record Examination (GRE) scores on the Aptitude Test (verbal, quantitative, and analytical writing).
4. International students are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exams, meeting the minimum score required by the Graduate School.
5. Statement of purpose describing academic interests and professional goals. Doctoral applicants must specify which concentration they wish to pursue (comparative literature, cultural studies, Hispanic Studies, applied linguistics, or translation) and describe how their research interests might be met by working with specific members of our faculty
6. An academic writing sample preferably from a research or examination paper from a literature or culture course, showing evidence of critical thinking, writing ability and research skills
7. Three letters of recommendation from former instructors, employers, or supervisors

Requirements for the Doctoral Degree:

1. Ph.D. candidates must complete a minimum of 66 hours of graduate course work (including credit taken for the M.A. or M.F.A.) and must attain a 3.00 grade-point average in each of their fields. Part or all of the graduate course work completed at other U.S. institutions or accredited institutions abroad with a grade of "B" or higher and taken within seven years of starting the doctoral program may count towards the 66 hours requirement with the approval of the Program Advisory Committee. However, it should be noted that this course work will not be reflected on the student's transcript.
2. WLIT 5193 Introduction to Comparative Literature is required of all Ph.D. candidates in the Program in Comparative Literature and Cultural Studies.
3. Ph.D. candidates must take 24 hours in a main field. The goal is for the student to use this coursework to create a primary field of specialization.
4. Ph.D. candidates must complete 18 hours in one of the five doctoral concentrations —traditional comparative literature, cultural studies, interdisciplinary Hispanic studies, translation, and world languages and applied linguistics—as described in detail below.

5. Ph.D. candidates must take 9 hours in world literatures and cultures outside their main field, providing historical depth and geographical breadth to their literary and cultural studies.
6. Ph.D. students must complete an additional 12 elective credits. They may use these to develop a tertiary field, strengthen primary or secondary fields, or to take courses outside those fields.
7. Ph.D. candidates must take 18 dissertation hours.
8. Ph.D. students must declare a concentration by the end of the first year and define a Dissertation Committee by the end of the second year. The committee consists of the student's research supervisor plus two other faculty members. This committee will administer the candidacy exam, the proposal defense, and the dissertation defense.
9. Ph.D. students must demonstrate reading proficiency in two languages other than English before being admitted into candidacy. The language requirements may be fulfilled either by completing 12 hours in the target language or by taking the reading exam administered by the Department of World Languages, Literatures, and Cultures. Documented coursework from an accredited institution in which the language of instruction is other than English may be used to substitute for a language exam.
10. Candidacy: Upon completion of coursework and world languages requirements, all Ph.D. students must take a two part candidacy exam and present a dissertation proposal.
11. The candidacy examination is based on a set of reading lists based on coursework and areas of concentration, that the student composes with the guidance of their advisor and committee members. The reading list is divided into five sections: two lists comprising the student's areas of concentration and three lists covering world literatures and cultures. The candidacy examination has two parts:
 - a. A written examination covering the student's world literatures and cultures fields;
 - b. A written examination covering the concentration areas of the reading lists.

Students may retake only once any examination they fail.

1. Dissertation Proposal: After successfully completing the candidacy examination, the Ph.D. student will submit a dissertation proposal to be discussed and approved in a formal meeting with the Dissertation Committee. This meeting is the proposal defense. A student failing a proposal defense may revise the proposal and retake the defense one time.
2. Dissertations in a language other than English. Students in the Comparative Literature and Cultural Studies Program may request permission to submit their dissertation in a language other than English, with legitimate justification. Valid reasons for submitting a dissertation in a language other than English includes the subject matter, special primary audience, publication venues, academic position in a foreign country, historical or literary value, and the documents to be used, analyzed and interpreted. Limited English writing skills is not a valid justification. Students must request approval of the target language from the dissertation committee, the program advisory committee, the program director and the dean of the graduate school before starting the project. All committee members must be proficient in the target language and approve target language usage. Abstracts must be written in English.
3. Upon passing both parts of the written examination as well as successfully completing the proposal defense, the student becomes a Ph.D. degree candidate and enters the dissertation stage.

4. Within the time limits specified by the Graduate School, each student must submit a dissertation acceptable to the student's dissertation committee.
5. Each student must pass a dissertation defense administered by the student's Dissertation Committee.

Requirements for the Interdisciplinary Hispanic Studies

Concentration (HISP): This concentration is designed for candidates with an M.A. in Spanish whose scholarly and teaching interests are primarily in Hispanic studies and in interdisciplinary and transnational approaches to the literatures and cultures of Spain, Latin America and Hispanic United States. Candidates in this concentration will complete 18 hours in one of these three fields: Iberian, Latin American or U.S. Latino/Latina literatures and cultures.

Ph.D. with Literary Translation Concentration

Admission Requirements:

1. Application to the Graduate School
2. Complete official transcripts of all undergraduate and graduate work
3. Graduate Record Examination (GRE) scores on the Aptitude Test (verbal, quantitative, and analytical writing).
4. International students are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exams, meeting the minimum score required by the Graduate School.
5. Statement of purpose describing academic interests and professional goals. Doctoral applicants must specify which concentration they wish to pursue (comparative literature, cultural studies, Hispanic Studies, applied linguistics, or translation) and describe how their research interests might be met by working with specific members of our faculty
6. An academic writing sample preferably from a research or examination paper from a literature or culture course, showing evidence of critical thinking, writing ability and research skills
7. Three letters of recommendation from former instructors, employers, or supervisors

Requirements for the Doctoral Degree:

1. Ph.D. candidates must complete a minimum of 66 hours of graduate course work (including credit taken for the M.A. or M.F.A.) and must attain a 3.00 grade-point average in each of their fields. Part or all of the graduate course work completed at other U.S. institutions or accredited institutions abroad with a grade of "B" or higher and taken within seven years of starting the doctoral program may count towards the 66 hours requirement with the approval of the Program Advisory Committee. However, it should be noted that this course work will not be reflected on the student's transcript.
2. WLIT 5193 Introduction to Comparative Literature is required of all Ph.D. candidates in the Program in Comparative Literature and Cultural Studies.
3. Ph.D. candidates must take 24 hours in a main field. The goal is for the student to use this coursework to create a primary field of specialization.
4. Ph.D. candidates must complete 18 hours in one of the five doctoral concentrations—traditional comparative literature, cultural studies, interdisciplinary Hispanic studies, translation, and world languages and applied linguistics—as described in detail below.
5. Ph.D. candidates must take 9 hours in world literatures and cultures outside their main field, providing historical depth and geographical breadth to their literary and cultural studies.

6. Ph.D. students must complete an additional 12 elective credits. They may use these to develop a tertiary field, strengthen primary or secondary fields, or to take courses outside those fields.
7. Ph.D. candidates must take 18 dissertation hours.
8. Ph.D. students must declare a concentration by the end of the first year and define a Dissertation Committee by the end of the second year. The committee consists of the student's research supervisor plus two other faculty members. This committee will administer the candidacy exam, the proposal defense, and the dissertation defense.
9. Ph.D. students must demonstrate reading proficiency in two languages other than English before being admitted into candidacy. The language requirements may be fulfilled either by completing 12 hours in the target language or by taking the reading exam administered by the Department of World Languages, Literatures, and Cultures. Documented coursework from an accredited institution in which the language of instruction is other than English may be used to substitute for a language exam.
10. Candidacy: Upon completion of coursework and world languages requirements, all Ph.D. students must take a two part candidacy exam and present a dissertation proposal.
11. The candidacy examination is based on a set of reading lists based on coursework and areas of concentration, that the student composes with the guidance of their advisor and committee members. The reading list is divided into five sections: two lists comprising the student's areas of concentration and three lists covering world literatures and cultures. The candidacy examination has two parts:
 - a. A written examination covering the student's world literatures and cultures fields;
 - b. A written examination covering the concentration areas of the reading lists.

Students may retake only once any examination they fail.

1. Dissertation Proposal: After successfully completing the candidacy examination, the Ph.D. student will submit a dissertation proposal to be discussed and approved in a formal meeting with the Dissertation Committee. This meeting is the proposal defense. A student failing a proposal defense may revise the proposal and retake the defense one time.
2. Dissertations in a language other than English. Students in the Comparative Literature and Cultural Studies Program may request permission to submit their dissertation in a language other than English, with legitimate justification. Valid reasons for submitting a dissertation in a language other than English includes the subject matter, special primary audience, publication venues, academic position in a foreign country, historical or literary value, and the documents to be used, analyzed and interpreted. Limited English writing skills is not a valid justification. Students must request approval of the target language from the dissertation committee, the program advisory committee, the program director and the dean of the graduate school before starting the project. All committee members must be proficient in the target language and approve target language usage. Abstracts must be written in English.
3. Upon passing both parts of the written examination as well as successfully completing the proposal defense, the student becomes a Ph.D. degree candidate and enters the dissertation stage.
4. Within the time limits specified by the Graduate School, each student must submit a dissertation acceptable to the student's dissertation committee.

5. Each student must pass a dissertation defense administered by the student's Dissertation Committee.

Requirements for the Literary Translation Concentration (LTTR). This concentration is designed for candidates interested in advanced studies in translation theory and scholarly research on literary translation. Candidates in this concentration must take 18 hours of translation coursework including nine hours in translation workshops (ENGL 5043) and nine hours from the following form and theory courses in poetry and fiction (ENGL 5223, ENGL 5263, ENGL 5273, ENGL 5283, ENGL 5293). Courses may be substituted from related fields with advisor approval. The dissertation project may be a study of some translation issue or a book-length translation of a literary work with a critical introduction and annotated text. Candidates will typically have an M.F.A. in literary translation or an M.A. in Arabic, Classics, French, German, Spanish, or other languages and literatures.

Ph.D. with World Languages and Applied Linguistics Concentration

Admission Requirements:

1. Application to the Graduate School
2. Complete official transcripts of all undergraduate and graduate work
3. Graduate Record Examination (GRE) scores on the Aptitude Test (verbal, quantitative, and analytical writing).
4. International students are required to take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exams, meeting the minimum score required by the Graduate School.
5. Statement of purpose describing academic interests and professional goals. Doctoral applicants must specify which concentration they wish to pursue (comparative literature, cultural studies, Hispanic Studies, applied linguistics, or translation) and describe how their research interests might be met by working with specific members of our faculty
6. An academic writing sample preferably from a research or examination paper from a literature or culture course, showing evidence of critical thinking, writing ability and research skills
7. Three letters of recommendation from former instructors, employers, or supervisors

Requirements for the Doctoral Degree:

1. Ph.D. candidates must complete a minimum of 66 hours of graduate course work (including credit taken for the M.A. or M.F.A.) and must attain a 3.00 grade-point average in each of their fields. Part or all of the graduate course work completed at other U.S. institutions or accredited institutions abroad with a grade of "B" or higher and taken within seven years of starting the doctoral program may count towards the 66 hours requirement with the approval of the Program Advisory Committee. However, it should be noted that this course work will not be reflected on the student's transcript.
2. WLIT 5193 Introduction to Comparative Literature is required of all Ph.D. candidates in the Program in Comparative Literature and Cultural Studies.
3. Ph.D. candidates must take 24 hours in a main field. The goal is for the student to use this coursework to create a primary field of specialization.
4. Ph.D. candidates must complete 18 hours in one of the five doctoral concentrations—traditional comparative literature, cultural studies, interdisciplinary Hispanic studies, translation, and world languages and applied linguistics—as described in detail below.

5. Ph.D. candidates must take 9 hours in world literatures and cultures outside their main field, providing historical depth and geographical breadth to their literary and cultural studies.
6. Ph.D. students must complete an additional 12 elective credits. They may use these to develop a tertiary field, strengthen primary or secondary fields, or to take courses outside those fields.
7. Ph.D. candidates must take 18 dissertation hours.
8. Ph.D. students must declare a concentration by the end of the first year and define a Dissertation Committee by the end of the second year. The committee consists of the student's research supervisor plus two other faculty members. This committee will administer the candidacy exam, the proposal defense, and the dissertation defense.
9. Ph.D. students must demonstrate reading proficiency in two languages other than English before being admitted into candidacy. The language requirements may be fulfilled either by completing 12 hours in the target language or by taking the reading exam administered by the Department of World Languages, Literatures, and Cultures. Documented coursework from an accredited institution in which the language of instruction is other than English may be used to substitute for a language exam.
10. Candidacy: Upon completion of coursework and world languages requirements, all Ph.D. students must take a two part candidacy exam and present a dissertation proposal.
11. The candidacy examination is based on a set of reading lists based on coursework and areas of concentration, that the student composes with the guidance of their advisor and committee members. The reading list is divided into five sections: two lists comprising the student's areas of concentration and three lists covering world literatures and cultures. The candidacy examination has two parts:
 - a. A written examination covering the student's world literatures and cultures fields;
 - b. A written examination covering the concentration areas of the reading lists.

Students may retake only once any examination they fail.

1. Dissertation Proposal: After successfully completing the candidacy examination, the Ph.D. student will submit a dissertation proposal to be discussed and approved in a formal meeting with the Dissertation Committee. This meeting is the proposal defense. A student failing a proposal defense may revise the proposal and retake the defense one time.
2. Dissertations in a language other than English. Students in the Comparative Literature and Cultural Studies Program may request permission to submit their dissertation in a language other than English, with legitimate justification. Valid reasons for submitting a dissertation in a language other than English includes the subject matter, special primary audience, publication venues, academic position in a foreign country, historical or literary value, and the documents to be used, analyzed and interpreted. Limited English writing skills is not a valid justification. Students must request approval of the target language from the dissertation committee, the program advisory committee, the program director and the dean of the graduate school before starting the project. All committee members must be proficient in the target language and approve target language usage. Abstracts must be written in English.
3. Upon passing both parts of the written examination as well as successfully completing the proposal defense, the student becomes a Ph.D. degree candidate and enters the dissertation stage.

4. Within the time limits specified by the Graduate School, each student must submit a dissertation acceptable to the student's dissertation committee.
5. Each student must pass a dissertation defense administered by the student's Dissertation Committee.

Requirements for World Languages and Applied Linguistics

Concentration (WLAL): This concentration is designed for candidates with research and teaching interest in applied linguistics and second language pedagogy for world languages, literatures and cultures at the college level. Applicants should have a Master's of Arts in a world language (French, German, Spanish or other languages) or a field in the humanities or the social sciences. Candidates in this concentration must take 18 hours in applied linguistics related courses including: WLLC 5063 Teaching Foreign Languages on the College Level, WLLC 5463 Descriptive Linguistics, CIED 5923 Second Language Acquisition, two applied linguistics seminars (WLLC 6553 to be repeated for a total of six hours), a qualitative and/or quantitative research methods course, depending on the candidate's research project approved by the adviser, such as SOCI 5083 Applied Qualitative Research.

Courses

WLIT 5123. Survey of Russian Literature from Its Beginning to the 1917 Revolution. 3 Hours.

(Formerly WLIT 4123.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English. Graduate degree credit will not be given for both WLIT 4123 and WLIT 5123. (Typically offered: Irregular)

WLIT 5133. Survey of Russian Literature Since the 1917 Revolution. 3 Hours.

(Formerly WLIT 4133.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English with readings in English. Graduate degree credit will not be given for both WLIT 4133 and WLIT 5133. (Typically offered: Irregular)
This course is cross-listed with RUSS 5133.

WLIT 5193. Introduction to Comparative Literature. 3 Hours.

Literary theory, genres, movements, and influences. (Typically offered: Irregular)

WLIT 5443. Queer Theor(ies). 3 Hours.

Introduction to the complex history and evolution of Queer Theory into Queer Theor(ies) from Foucault to the Present. (Typically offered: Irregular)
This course is cross-listed with GNST 5443.

WLIT 5523. The Quran as Literature. 3 Hours.

The Quran as literary text: its style and form, historical context, translation, issues, communities of interpretation, and comparative perspectives. Course's integrated approach includes translations of literature originally in Arabic. All readings in English; students with reading abilities in Arabic encouraged to read original text. (Typically offered: Irregular)

WLIT 5623. The Bible as Literature. 3 Hours.

The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms. (Typically offered: Irregular)
This course is cross-listed with ENGL 5623.

WLIT 575V. Special Investigations on World Literatures and Cultures. 1-6 Hour.

Independent study of a special topic in world literatures and cultures. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 5993. African Literature. 3 Hours.

(Formerly WLIT 4993.) A study of modern African fiction, drama, poetry, and film from various parts of Africa in their cultural context. Works are in English or English translation. Graduate credit will not be given for both WLIT 4993 and WLIT 5993. (Typically offered: Irregular)

WLIT 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

WLIT 603V. Special Studies in Comparative Literature. 1-6 Hour.

Special studies in comparative literature. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 6703. Psychoanalysis and Culture. 3 Hours.

Readings of key texts in Psychoanalytic thought and cultural criticism including Freud, Lacan, Kristeva, Certeau, Zizek, and others. Selections of Psychoanalytic approaches to literature, film and gender and trauma studies. (Typically offered: Irregular)

WLIT 6713. Literature of Spain, 711-1615 C.E.. 3 Hours.

Examines the multiple cultural traditions of Spain between 711-1615 C.E. and train to produce scholarship pertinent to the field. Integrated approach includes English translations of literature originally in Arabic (50%+ of content), Hebrew, Spanish, French. Students with reading abilities in original languages encouraged to read original text. (Typically offered: Irregular)

WLIT 6803. Postcolonial Theory and Subaltern Studies. 3 Hours.

Seminar examining the geopolitical (imperial, colonial and national) implications of knowledge and culture. Selected readings of early postcolonial texts by Cesaire, Fanon, and Fernandez Retamar, as well as more recent texts by Said, Spivak, Bhabha, Mignolo, Beverly and Chakrabarty among others. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 690V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Computer Science and Computer Engineering (CSCE)

Dale Thompson
Interim Head of the Department
JBHT 504 J.B. Hunt Center for Academic Excellence
479-575-5090

Brajendra Nath Panda
Graduate Coordinator
504 J.B. Hunt Center for Academic Excellence
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Computer Science and Computer Engineering Website (<http://computer-science-and-computer-engineering.uark.edu/>)

Degrees Conferred:

M.S. in Computer Science (CSCE)
M.S.Cmp.E. in Computer Engineering (CENG)
Ph.D. in Engineering (CSCE)

Graduate Certificates (non-degree):

Graduate Certificate in Cybersecurity (CYBR)

Primary Areas of Faculty Research: Distributed computer systems and networks, database security, computer security, digital forensics, big data security, hardware security, cyber-physical systems security, next-generation computer architectures, RFID information security, embedded systems, hardware/software co-design, low-power systems design, pervasive and mobile computing, image and video processing, natural language processing, biometrics, machine learning and deep learning, pattern recognition and machine intelligence, data mining, artificial intelligence, data privacy, computer-aided design.

M.S.Cmp.E. in Computer Engineering

Prerequisite to Degree Programs: The Computer Science and Computer Engineering Department offers two Master of Science degrees, one in Computer Science and one in Computer Engineering. Applicants to the Computer Science M.S. program should have a Bachelor of Science degree in computer science from an accredited program. Applicants to the Computer Engineering M.S. program should have a Bachelor of Science degree in computer engineering from an accredited program. Applicants to either program whose transcripts do not show core courses relevant to the program to which they are applying will be assigned deficiency courses. All applicants must present acceptable scores on the General Test of the Graduate Records Examination (GRE).

Master of Science Degree Programs: The two M.S. degrees have common requirements in terms of the number of credit hours required. The two programs are differentiated by the student's advisory committee. The advisory committee will approve courses that are appropriate for the student's program and interests. Students enrolled in the computer engineering program can expect to take more courses with a hardware and systems emphasis, while students enrolled in the computer science program can expect to take more courses with an emphasis in software and theory. All rules and regulations of the CSCE Department, the College of Engineering, and the Graduate School must be followed.

Master of Science in Computer Engineering (C.S.Cmp.E.)

Degree Requirements: The *thesis option* (30 hours) requires the successful completion of at least six credit hours of CSCE 610V Master's Thesis, plus 24 credit hours of course work approved by the candidate's advisory committee. At least 15 of the 24 hours must be CSCE courses at the 5000 level. The remaining nine hours may include no more than six hours of transfer work, three hours of individual study, six hours from outside the department, and nine hours of courses at the 4000 level.

All master's students completing the thesis option must pass an oral examination and defense of the thesis in, at most, two attempts. The first attempt may not occur before all of the following qualifying conditions have been satisfied:

- Candidate has completed at least 21 hours that are applicable toward the degree;
- Candidate is currently enrolled in CSCE 610V.
- Candidate's cumulative grade-point average on all graduate-level courses is 3.0 or higher;
- Any deficiencies assigned upon admission to the program have been removed; Candidate must be continuously enrolled, except for summers, until the thesis is defended.

The final exam is comprehensive; a portion of the exam will be devoted to questions concerning courses completed by the student. Another portion of the exam will be directed toward a defense of the thesis. Reading copies of the thesis should be delivered to members of the Thesis

Committee at least two weeks prior to undertaking the final examination. If a student is unsuccessful, the Program of Study committee may recommend that the examination be repeated. If so, the requirements to be satisfied prior to reexamination will be stipulated and a time limitation specified.

All other conditions that have been specified by the student's advisory or thesis committee must be satisfied.

The *course work* option requires the successful completion of 33 credit hours of course work approved by the candidate's graduate committee. At least 21 of the 33 hours must be CSCE courses at the 5000 level. The remaining twelve hours may include no more than six hours of transfer work, three hours of individual study, six hours from outside the department, and nine hours of courses at the 4000 level.

All master's students completing the course work option must pass an oral examination of the course work in the final semester of enrollment of graduate-level courses and the following conditions have been satisfied:

1. The candidate's cumulative grade-point average on all graduate-level courses is 3.0 or higher.
2. Any deficiencies assigned upon admission to the program have been removed.

Students who complete a B.S. degree in CSCE at the University of Arkansas, Fayetteville, with a cumulative GPA of 3.5 or greater may count up to six hours of CSCE graduate-level course work (5000 level) completed as an undergraduate student towards the graduate degree. Students must submit the "Request for Retroactive Graduate Credit" form to the Graduate coordinator in their first semester of graduate study.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Grade Requirements: Students in the master's program in Computer Science or Computer Engineering must maintain grades at the B level or higher. Should a student receive a grade of C or lower, the student must immediately contact the student's adviser and the Graduate Coordinator to discuss the consequences and options available. The graduate adviser and the CSCE graduate program coordinator will select the student's classes for the following semester. If a second grade lower than B is received the student will be terminated from the program. The student may appeal the termination to the Graduate Studies Committee. If the student is allowed to remain in the program the student should expect to be required to repeat one or more classes in which a grade less than B was received as well as other possible requirements.

M.S.C.S. in Computer Science

Prerequisite to Degree Programs: The Computer Science and Computer Engineering Department offers two Master of Science degrees, one in Computer Science and one in Computer Engineering. Applicants to the Computer Science MS program should have a Bachelor of Science degree in computer science from an accredited program. Applicants to the Computer Engineering MS program should have a Bachelor of Science degree in computer engineering from an accredited program. Applicants to either program whose transcripts do not show core courses relevant to the program to which they are applying will be assigned deficiency courses. All applicants must present acceptable scores on the General Test of the Graduate Records Examination (GRE).

Master of Science Degree Programs: The two M.S. degrees have common requirements in terms of the number of credit hours required. The two programs are differentiated by the student's advisory committee.

The advisory committee will approve courses that are appropriate for the student's program and interests. Students enrolled in the computer engineering program can expect to take more courses with a hardware and systems emphasis, while students enrolled in the computer science program can expect to take more courses with an emphasis in software and theory. All rules and regulations of the CSCE Department, the College of Engineering, and the Graduate School must be followed.

Master of Science in Computer Science (M.S.C.S.)

Degree Requirements: The *thesis option* (30 hours) requires the successful completion of at least six credit hours of CSCE 610V Master's Thesis, plus 24 credit hours of course work approved by the candidate's advisory committee. At least 15 of the 24 hours must be CSCE courses at the 5000 level. The remaining nine hours may include no more than 6 hours of transfer work, 3 hours of individual study, 6 hours from outside the department, and 9 hours of courses at the 4000 level.

All master's students completing the thesis option must pass an oral examination and defense of the thesis in, at most, two attempts. The first attempt may not occur before all of the following qualifying conditions have been satisfied:

- Candidate has completed at least 21 hours that are applicable toward the degree;
- Candidate is currently enrolled in CSCE 610V.
- Candidate's cumulative grade-point average on all graduate-level courses is 3.0 or higher;
- Any deficiencies assigned upon admission to the program have been removed; Candidate must be continuously enrolled, except for summers, until the thesis is defended.

The final exam is comprehensive; a portion of the exam will be devoted to questions concerning courses completed by the student. Another portion of the exam will be directed toward a defense of the thesis. Reading copies of the thesis should be delivered to members of the Thesis Committee at least two weeks prior to undertaking the final examination. If a student is unsuccessful, the Program of Study committee may recommend that the examination be repeated. If so, the requirements to be satisfied prior to reexamination will be stipulated and a time limitation specified.

All other conditions that have been specified by the student's advisory or thesis committee must be satisfied.

The *course work* option requires the successful completion of 33 credit hours of course work approved by the candidate's graduate committee. At least 21 of the 33 hours must be CSCE courses at the 5000 level. The remaining 12 hours may include no more than 6 hours of transfer work, three hours of individual study, 6 hours from outside the department, and 9 hours of courses at the 4000 level.

All master's students completing the course work option must pass an oral examination of the course work in the final semester of enrollment of graduate-level courses and the following conditions have been satisfied:

1. The candidate's cumulative grade-point average on all graduate-level courses is 3.0 or higher.
2. Any deficiencies assigned upon admission to the program have been removed.

Students who complete a B.S. degree in CSCE at the University of Arkansas, Fayetteville, with a cumulative GPA of 3.5 or greater may count

up to 6 hours of CSCE graduate-level course work (5000 level) completed as an undergraduate student towards the graduate degree. Students must submit the "Request for Retroactive Graduate Credit" form to the Graduate coordinator in their first semester of graduate study.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Grade Requirements: Students in the master's programs in Computer Science or Computer Engineering must maintain grades at the B level or higher. Should a student receive a grade of C or lower, the student must immediately contact the student's adviser and the Graduate Coordinator to discuss the consequences and options available. The graduate adviser and the CSCE graduate program coordinator will select the student's classes for the following semester. If a second grade lower than B is received the student will be terminated from the program. The student may appeal the termination to the Graduate Studies Committee. If the student is allowed to remain in the program the student should expect to be required to repeat one or more classes in which a grade less than B was received as well as other possible requirements.

Ph.D. in Computer Engineering

Requirements for the Doctor of Philosophy Degree: In addition to the requirements of the Graduate School, the following departmental requirements must be satisfied by candidates for a Doctor of Philosophy degree with a concentration in either computer science or computer engineering.

A student is admitted to candidacy by first passing a Ph.D. Qualifying Examination and then, at a later time, a Candidacy Examination on the student's dissertation proposal. The student must attempt the Ph.D. Qualifying Examination no later than the end of the first year of study for students admitted to the program with a master's degree and no later than the end of the third year for students admitted to the program without a master's degree.

The Qualifying Examination is scored Pass or Fail on each of the four sections of the examination. If a Fail is assigned on any section of the examination, then the student must repeat that section at the next administration of the examination. A second failure will terminate the student's course of study in the doctoral program. In preparation for the Ph.D. Qualifying Examination, a student should refer to the CSCE Graduate Student Handbook.

Each student must form a doctoral advisory committee before registering for dissertation hours. This committee must consist of four faculty members who hold qualifying status on the graduate faculty. Three members, including the chair, must hold regular or adjunct appointments in the Department of Computer Science and Computer Engineering. The fourth member should be from outside the department.

For the Candidacy Examination, the student is expected to present a dissertation proposal. Committee members will judge the proposal on its scientific merit, originality, and difficulty. Each Ph.D. student is required to defend a completed dissertation before his or her dissertation committee.

Summary:

1. All students must complete a minimum of 72 semester hours of graduate-level credit beyond the bachelor's degree, including a minimum of 42 semester hours of course work and a minimum of 30 semester hours of dissertation research credits.

2. A minimum of 30 semester hours of course work must be at the graduate level (5000 or above)
3. Upon recommendation of the student's advisory committee, a student who has entered the Ph.D. program after a master's degree may receive credit for up to 30 semester hours. If the 30 hours includes master's thesis research, the advisory committee may credit up to six hours of thesis research toward the minimum dissertation research requirement.
4. Ph.D. students must complete a minimum of nine semester credit hours of course work in a set of coherent courses in a related subject area approved by the student's advisory committee.
5. Students must earn a minimum cumulative grade-point average of 3.0 on all graduate courses attempted.
6. Ph.D. students must complete and defend a dissertation on a topic in the student's major field of study.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Requirements for Ph.D. in Engineering (Computer Science)

Requirements for the Doctor of Philosophy Degree: In addition to the requirements of the Graduate School, the following departmental requirements must be satisfied by candidates for a Doctor of Philosophy degree with a concentration in either computer science or computer engineering.

A student is admitted to candidacy by first passing a Ph.D. Qualifying Examination and then, at a later time, a Candidacy Examination on the student's dissertation proposal. The student must attempt the Ph.D. Qualifying Examination no later than the end of the first year of study for students admitted to the program with a master's degree and no later than the end of the third year for students admitted to the program without a master's degree.

The Qualifying Examination is scored Pass or Fail on each of the four sections of the examination. If a Fail is assigned on any section of the examination, then the student must repeat that section at the next administration of the examination. A second failure will terminate the student's course of study in the doctoral program. In preparation for the Ph.D. Qualifying Examination, a student should refer to the CSCE Graduate Student Handbook.

Each student must form a doctoral advisory committee before registering for dissertation hours. This committee must consist of four faculty members who hold qualifying status on the graduate faculty. Three members, including the chair, must hold regular or adjunct appointments in the Department of Computer Science and Computer Engineering. The fourth member should be from outside the department.

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Summary:

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5. Students must earn a minimum cumulative grade-point average of 3.0 on all graduate courses attempted.
6. Ph.D. students must complete and defend a dissertation on a topic in the student's major field of study.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Certificate in Cybersecurity

Program Description: The Cybersecurity Graduate Certificate prepares students to protect valuable data assets and develop cyber-centric multidisciplinary security skills for predicting and avoiding cyber threats.

Program Requirements: Students are required to take 12 hours of coursework to complete the Cybersecurity Graduate Certificate.

Required Course

CSCE 5323	Computer Security	3
Choose 9 hours from the following courses:		9
CSCE 5333	Computer Forensics	
CSCE 5433	Advanced Cryptography	
CSCE 5623	Secure Digital System Design	
CSCE 5653	Network Security	
CSCE 5663	Database Security	
CSCE 5753	Wireless Systems Security	
CSCE 5763	Privacy Enhancing Technologies	
CSCE 5833	Computer Architecture Security	
Total Hours		12

Graduate Faculty

Andrews, David, Ph.D. (Syracuse University), M.S., B.S.E.E. (University of Missouri-Columbia), Professor, 2008.

Di, Jia, Ph.D. (University of Central Florida), M.S., B.S. (Tsinghua University), Professor, 2004.

Gauch, John Michael, Ph.D. (University of North Carolina at Chapel Hill), M.Sc., B.Sc. (Queen's University, Canada), Professor, 2008.

Gauch, Susan E., Ph.D. (University of North Carolina at Chapel Hill), M.Sc., B.Sc. (Queen's University, Canada), Professor, 2007.

Huang, Miaoqing, Ph.D. (George Washington University), B.S. (Fudan University), Associate Professor, 2010.

Le, Thi Hoang Ngan, Ph.D. (Carnegie Mellon University), M.S., B.S. (University of Natural Sciences, Ho Chi Minh City, Vietnam), Assistant Professor, 2019.

Li, Qinghua, Ph.D. (Pennsylvania State University), M.S. (Tsinghua University), B.E. (Xi'an Jiaotong University), Associate Professor, 2013.

Li, Wing Ning, Ph.D., M.S. (University of Minnesota-Twin Cities), B.S. (University of Iowa), Professor, 1989.

Liu, Xiaoqing Frank, Ph.D. (Texas A&M University), M.S. (Southeast University, China), B.S. (National University of Defense Technology, China), Professor, 2015.

Luu, Khoa, Ph.D. (Concordia University), Assistant Professor, 2018.

Nelson, Alexander H., Ph.D. (University of Maryland), M.S., B.S. (University of Arkansas), Assistant Professor, 2017.

Panda, Brajendra Nath, Ph.D. (North Dakota St. University), M.S. (Utkal University, India), Professor, 2001.

Parkerson, Pat, Ph.D., B.S. (University of Arkansas), Associate Professor, 1990.

Patitz, Matthew J., Ph.D., M.S., B.S. (Iowa State University), Associate Professor, 2012.

Peng, Yarui, Ph.D., M.S. (Georgia Institute of Technology), B.S. (Tsinghua University), Assistant Professor, 2017.

Thompson, Dale R., Ph.D. (North Carolina State University), M.S., B.S. (Mississippi State University), Associate Professor, 2000.

Wu, Xintao, Ph.D. (George Mason University), M.E. (Chinese Academy of Space Technology), B.S. (University of Science and Technology of China), Professor, 2014.

Zhan, Justin, Ph.D. (University of Ottawa, Canada), M.S. (Syracuse University), Professor, 2019.

Courses

CSCE 5013. Advanced Special Topics in Computer Science or Computer Engineering. 3 Hours.

Consideration of current computer engineering or computer science topics not covered in other courses. Prerequisite: Graduate standing in Computer Science Computer Engineering. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

CSCE 5033. Advanced Algorithms. 3 Hours.

Design of computer algorithms, with primary emphasis on the development of efficient implementation. Prerequisite: Graduate standing in Computer Science Computer Engineering. (Typically offered: Irregular)

CSCE 5043. Advanced Artificial Intelligence. 3 Hours.

In-depth introduction to AI. Topics include: philosophical foundations, cognition, intelligent agents, AI languages, search, genetic algorithms, first order and modal logic, inference, resolution, knowledge representation, ontologies, problem solving, planning, expert systems, uncertainty, probabilistic reasoning, fuzzy logic, machine learning, natural language processing, machine vision, and robotics. Prerequisite: CSCE 4613 or Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5053. Advanced Virtual Worlds. 3 Hours.

In depth study of 3D multi-user virtual worlds covering application domains like retail and healthcare logistics, simulations, training, and gaming as well as platform architectures. Students will apply their knowledge of programming and data structures while using synthetic worlds to explore, model and script future smart worlds where computing is pervasive. Prerequisite: Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5063. Machine Learning. 3 Hours.

An introduction to machine learning, with particular emphasis on neural network techniques. This course presents the basic principles underlying algorithms that improve with experience, and covers using them effectively for modeling data and making predictions. Prerequisite: Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5073. Data Mining. 3 Hours.

This course surveys the most common methods used in data mining and machine learning. It involves several projects in which students will implement tools that are useful for mining knowledge from data and making predictions. The course will study both heuristic algorithms and statistical techniques. Prerequisite: CSCE 3193 and (INEG 2313 or STAT 3013) or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5114. Embedded Systems. 4 Hours.

(Formerly CSCE 4114.) The architecture, software, and hardware of embedded systems. Involves a mixture of hardware and software for the control of a system (including electrical, electro-mechanical, and electro-chemical systems). They are found in a variety of products including cars, VCRs, HDTVs, cell phones, pacemakers, spacecraft, missile systems, and robots for factory automation. Graduate degree credit will not be given for both CSCE 4114 and CSCE 5114. Corequisite: Lab component. Prerequisite: CSCE 2214 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Fall)

CSCE 5133. Algorithms. 3 Hours.

(Formerly CSCE 4133.) Provides an introduction to formal techniques for analyzing the complexity of algorithms. The course surveys important classes of algorithms used in computer science and engineering. Graduate degree credit will not be given for both CSCE 4133 and CSCE 5133. Prerequisite: ((CSCE 3193 and (MATH 2603 or MATH 2803)) or (MATH 4423) or (Computer Science/Computer Engineering(CS/CE) graduate standing). (Typically offered: Fall)

CSCE 5173. Formal Languages and Computability. 3 Hours.

(Formerly CSCE 4323.) Finite Automata and regular languages, regular expressions, context-free languages and pushdown automata, nondeterminism, grammars, and Turing machines. Church's thesis, halting problem, and undecidability. Graduate degree credit will not be given for both CSCE 4323 and CSCE 5173. Prerequisite: CSCE 4133 or CSCE 5133 (formerly CSCE 4133). (Typically offered: Spring)

CSCE 5183. Advanced Data Structures. 3 Hours.

(Formerly CSCE 4263.) This course continues the study of data structures, algorithmic analysis for these data structures, and their efficient implementation to support standard library in programming languages. Topics include: AVL trees, Red-Black trees, Splay trees, Optimal Binary Search trees, 2-3 tree, 2-3-4 tree, B-trees, Segment trees, Leftist Heaps, Binomial Heaps, Fibonacci Heap, Disjoint Set, Hashing, and big integer with hundreds to thousands of digits. Graduate degree credit will not be given for both CSCE 4263 and CSCE 5183. Prerequisite: CSCE 3193 or Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5193. Concurrent Computing. 3 Hours.

(Formerly CSCE 4253.) Programming concurrent processes; computer interconnection network topologies; loosely coupled and tightly coupled parallel computer architectures; designing algorithms for concurrency; distributed computer architectures. Graduate degree credit will not be given for both CSCE 4253 and CSCE 5193. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5203. Advanced Database Systems. 3 Hours.

Topics include: object databases, distributed databases, XML query, data warehouses, network as database systems, peer-peer data sharing architectures, data grids, data mining, logic foundations, semantic databases, spatial and temporal databases, and knowledge bases. Prerequisite: CSCE 4523 or CSCE 5523. (Typically offered: Irregular)

CSCE 5213. Bioinformatics. 3 Hours.

Application of algorithmic techniques to the analysis and solution of biological problems. Topics include an introduction to molecular biology and recombinant DNA technology, biological sequence comparison, and phylogenetics, as well as topics of current interest. Prerequisite: Instructor consent or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5223. Introduction to Integrated Circuit Design. 3 Hours.

Design and layout of large scale digital integrated circuits using CMOS technology. Topics include MOS devices and basic circuits, integrated circuit layout and fabrication, dynamic logic, circuit design, and layout strategies for large scale CMOS circuits. Students may not receive credit for both CSCE 4333 and CSCE 5223. Prerequisite: ELEG 3214 or ELEG 3933 and MATH 2584. (Typically offered: Fall)

CSCE 5233. Low Power Digital Systems. 3 Hours.

(Formerly CSCE 4233.) The reduction of power consumption is rapidly becoming one of the key issues in digital system design. Traditionally, digital system design has mainly focused on performance and area trade-offs. This course will provide a thorough introduction to digital design for lower consumption at the circuit, logic, and architectural level. Graduate degree credit will not be given for both CSCE 4233 and CSCE 5233. Prerequisite: CSCE 2214 with a grade of C or better. (Typically offered: Irregular)

CSCE 5253L. Integrated Circuit Design Laboratory I. 3 Hours.

Design and layout of large scale digital integrated circuits. Students design, check and simulate digital integrated circuits which will be fabricated, and tested in I.C. Design Laboratory II. Topics include computer aided design, circuit timing, and wire delay. Prerequisite: CSCE 4333. (Typically offered: Irregular)
This course is cross-listed with ELEG 5253L.

CSCE 5263. Computational Complexity. 3 Hours.

Turing machines, recursion theory and computability, complexity measures, NP-completeness, analysis on NP-complete problems, pseudo-polynomial and approximation. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5273. Big Data Analytics and Management. 3 Hours.

Topics include principles of distributed data computing and management, design and implementation of non-relational data systems, crowd sourcing and human computation, big data analytics and scalable machine learning, real-time streaming data analysis, and social aware computing. Prerequisite: CSCE 3193 and INEG 2313 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5283. Graph and Combinatorial Algorithms. 3 Hours.

A study of algorithms for graphs and combinatorics with special attention to computer implementation and runtime efficiency. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5293. Computer Architecture. 3 Hours.

(Formerly CSCE 4213.) The architecture of modern scalar and parallel computing systems. Techniques for dynamic instruction scheduling, branch prediction, instruction level parallelism, shared and distributed memory multiprocessor systems, array processors, and memory hierarchies. Graduate degree credit will not be given for both CSCE 4213 and CSCE 5293. Prerequisite: CSCE 2214 with a grade of C or better. (Typically offered: Spring)

CSCE 5313. Advanced Operating Systems. 3 Hours.

Concurrent processes and process communication; mutual exclusion and synchronization principles; kernel philosophy; resource allocation and deadlock; and case studies of specific operating systems. Prerequisite: CSCE 3613 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5323. Computer Security. 3 Hours.

Study of a broad selection of contemporary issues in computer security. Topics include access control, security policies, authentication methods, secure system design, and information assurance. Prerequisite: CSCE 3613 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5333. Computer Forensics. 3 Hours.

Various methods for identification, preservation, and extraction of electronic evidence at a computer crime scene. Specific topics include auditing and investigation of network and host intrusions, computer forensics tools, resources for system administrators and information security officers, legal issues related to computer and network forensics. Prerequisite: CSCE 5323. (Typically offered: Irregular)

CSCE 5343. Advanced Software Engineering. 3 Hours.

This course is about software metrics and models. It will focus on quantitative methods and techniques for management of software projects, design of software systems, and improvement of software quality. The material covered will be metrics and models used in the software lifecycle, such as software requirements metrics, design metrics, implementation metrics, testing metrics, effort estimation model. Prerequisite: CSCE 3513 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5353. CPLD/FPGA-Based System Design. 3 Hours.

(Formerly CSCE 4353.) Field Programmable Logic devices (FPGAs/CPLDs) have become extremely popular as basic building blocks for digital systems. They offer a general architecture that users can customize by inducing permanent or reversible physical changes. This course will deal with the implementation of logic options using these devices. Graduate degree credit will not be given for both CSCE 4353 and CSCE 5353. Prerequisite: CSCE 2214 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5373. Electronic Design Automation. 3 Hours.

This course studies physical design, analysis and optimization of VLSI circuits and systems with emphasis on computational realizations and optimization. We start with some related topics such as graph algorithms and discuss various well-known algorithms and methodologies in the design process of VLSI circuits, including design partitioning, logic synthesis, floorplanning, routing, static timing analysis and performance-driven layout. It requires a basic knowledge of digital circuit design, data structure, and object-oriented programming. Students cannot receive credit for both CSCE 4373 and CSCE 5373. Prerequisite: Graduate standing in Computer Engineering, Computer Science, or Electrical Engineering. (Typically offered: Irregular)

CSCE 5423. Cryptography. 3 Hours.

(Formerly CSCE 4433.) This course provides a general introduction to modern cryptography. Topics include: stream ciphers, block ciphers, message authentication codes, public key encryption, key exchange, and signature schemes. Graduate degree credit will not be given for both CSCE 4433 and CSCE 5423. Prerequisite: CSCE 2014 with a grade of C or better and (MATH 2603 or MATH 2803) or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5433. Advanced Cryptography. 3 Hours.

This course provides an in-depth look into some facet of either cryptographic theory or the implementation of cryptography. Topics may include: the discrete logarithm problem, integer factorization, information theory, elliptic curves, lattices, pseudorandom number generators, zero-knowledge proofs, and quantum cryptography. Prerequisite: CSCE 4433 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5523. Database Management Systems. 3 Hours.

(Formerly CSCE 4523.) Introduction to database management systems, architecture, storage structures, indexing, relational data model, E-R diagrams, query languages, SQL, ODBC, transaction management, integrity, and security. Graduate degree credit will not be given for both CSCE 4523 and CSCE 5523. Prerequisite: CSCE 3193 with a C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Spring)

CSCE 5533. Advanced Information Retrieval. 3 Hours.

Study of the architecture, implementation, and evaluation of current information retrieval systems. Students will apply their knowledge of programming and data structures to implement a large system with an emphasis on efficiency and scalability. They will study current research in the field and implement individual or group projects on advanced topics. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5543. Statistical Natural Language Processing. 3 Hours.

Introduction to statistical natural language processing (NLP). Covers the theory and algorithms needed for building NLP tools, provides broad coverage of mathematical and linguistic foundations, and detailed discussion of statistical methods for text mining and information extraction. Current research and applications of statistical NLP will be discussed. Prerequisite: CSCE 2014 and (STAT 3013 or INEG 2313) or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5553. Software Architecture. 3 Hours.

(Formerly CSCE 4543.) A study of software architecture through the use of case studies drawn from real systems designed to solve real problems from technical as well as managerial perspectives. Techniques for designing, building, and evaluating software architectures. Graduate degree credit will not be given for both CSCE 4543 and CSCE 5553. Prerequisite: CSCE 4133 or CSCE 5133 (formerly CSCE 4133) and CSCE 3513. (Typically offered: Irregular)

CSCE 5613. Artificial Intelligence. 3 Hours.

(Formerly CSCE 4613.) Introduction to intelligent agents, AI languages, search, first order logic, knowledge representation, ontologies, problem solving, natural language processing, machine vision, machine learning, and robotics. Graduate degree credit will not be given for both CSCE 4613 and CSCE 5613. Prerequisite: CSCE 2014 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5623. Secure Digital System Design. 3 Hours.

This course is to give graduate students an insight of contemporary security-related issues in modern digital systems. In addition to lectures, students will be practicing secure digital system design during a project. (Typically offered: Irregular)

CSCE 5643. Computer Communications Networks. 3 Hours.

A study of computer communication networks, including the data link layer, routing, flow-control, local area networks, TCP/IP, ATM, B-ISDN, queuing analysis, and recent developments in computer communications. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5653. Network Security. 3 Hours.

This course introduces security and secrecy in a networked environment. It is intended to familiarize students with the elements of secure communication, and how they inter-relate to provide secure networks in public and private settings. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5663. Database Security. 3 Hours.

This is an advanced course covering security issues in database systems. Topics to be covered include discretionary and mandatory access control policies, multilevel secure database systems, auditing, data recovery, database intrusion detection, database insider threat, etc. Prerequisite: CSCE 4523 or CSCE 5523. (Typically offered: Irregular)

CSCE 5673. Mobile Programming. 3 Hours.

(Formerly CSCE 4623.) An introduction to software development on mobile devices. The major topics covered in this course include underlying concepts and principles in mobile programming, as well as hands-on programming experience on mobile devices with an emphasis on smartphones. Graduate degree credit will not be given for both CSCE 4623 and CSCE 5673. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5683. Image Processing. 3 Hours.

The objective of this class is to give students a hands-on introduction to the fundamentals of image processing. A variety of image processing techniques and applications will be discussed including image enhancement, noise removal, spatial domain and frequency domain filtering, image restoration, color image processing, image compression, edge detection and image segmentation. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5693. Graphics Processing Units Programming. 3 Hours.

(Formerly CSCE 4643.) This course provides an introduction to massively parallel programming using Graphics Processing Units (GPUs). Topics include basic programming model, GPU thread hierarchy, GPU memory architecture, and performance optimization techniques and parallel patterns needed to develop real-life applications. Graduate degree credit will not be given for both CSCE 4643 and CSCE 5693. Prerequisite: CSCE 2014 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5703. Computer Vision. 3 Hours.

The objective of this course is to give students a hands-on introduction to the fundamentals of computer vision. Topics include image formation, object modeling, image processing, feature and edge detection, image segmentation, motion estimation, depth from stereo, shape description and object recognition. Prerequisite: CSCE 3193 and CSCE 4613 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5753. Wireless Systems Security. 3 Hours.

Wireless systems such as wireless local area networks, cellular and mobile networks, and sensor networks are vulnerable to attacks. The goal of the class is for students to understand how to design secure wireless systems. Security topics include confidentiality, integrity, availability, privacy, and control of fraudulent usage of networks. Issues addressed include basic wireless theory, cryptography, threat modeling, risks, and mitigation techniques. Prerequisite: Graduate standing in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5763. Privacy Enhancing Technologies. 3 Hours.

This course introduces privacy enhancing technologies and hot privacy topics in modern computing systems. Students will be exposed to many interesting privacy problems, study privacy enhancing technologies, and apply their knowledge to explore an open research problem in a research-oriented project. After completing this course, students will gain broad knowledge of the state-of-the-art privacy enhancing technologies and open research problems. They will also develop skills and enhance potentials to do research on privacy and security. Prerequisite: Must be a graduate student in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5773. Computer Networks. 3 Hours.

(Formerly CSCE 4753.) This course is an introductory course on computer networks. Using the Internet as a vehicle, this course introduces underlying concepts and principles of modern computer networks, with emphasis on protocols, architectures, and implementation issues. Graduate degree credit will not be given for both CSCE 4753 and CSCE 5773. Prerequisite: INEG 2313 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5783. Cloud Computing and Security. 3 Hours.

Cloud computing has entered the mainstream of information technology, providing highly elastic scalability in delivery of enterprise applications and services. In this course, we will focus on the architecture of today's cloud computing, the technologies used within them, application development using contemporary cloud computing tools, and the security risks and management in the cloud. Graduate degree credit will not be given for both CSCE 4783 and CSCE 5783. Prerequisite: CSCE 3613 or graduate standing in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5813. Computer Graphics. 3 Hours.

(Formerly CSCE 4813.) Introduction to the theory and algorithms used in computer graphics systems and applications. Topics include: 2D and 3D geometric models (points, lines, polygons, surfaces), affine transformations (rotation, translation, scaling), viewpoint calculation (clipping, projection), lighting models (light-material interactions, illumination and shadow calculation). Students will implement their own graphics pipeline to demonstrate many of these techniques. Higher level computer graphics applications will be created using OpenGL. Graduate degree credit will not be given for both CSCE 4813 and CSCE 5813. Prerequisite: CSCE 2014 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5823. Multiprocessor Systems on Chip. 3 Hours.

This course covers the latest trends in advanced computer architecture for multiprocessor systems on chip for embedded and real time systems. Topics covered include multicore architectures, modeling abstractions, run time systems, and MIMD/SIMD heterogeneous architectures, Hw/Sw co-design techniques. Prerequisite: CSCE 3613 and CSCE 4213. (Typically offered: Irregular)

CSCE 5833. Computer Architecture Security. 3 Hours.

This course will cover fundamental principles and emerging implementation strategies to reason about, design and construct architecture level security capabilities in the manycore era. Coverage includes formal security models, new and emerging considerations for heterogeneous multiprocessor system on chip architectures, hardware and software implementation methods, operating systems for run time security enforcement. Prerequisite: CSCE 4213 or graduate standing in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5843. Reconfigurable Computing. 3 Hours.

This course will cover emerging and proposed techniques and issues in Reconfigurable Computing. Topics will include FPGA technologies, CAD/CAE tools, Hw/Sw co-design, system level synthesis, programming models and abstractions. Prerequisite: CSCE 4213 and CSCE 3613. (Typically offered: Irregular)

CSCE 5853. Information Security. 3 Hours.

(Formerly CSCE 4853.) This course covers principles, mechanisms, and policies governing confidentiality, integrity, and availability of digital information. Topics to be covered include security concepts and mechanisms, security policies, multilevel security models, system vulnerability, threat and risk assessment, basic cryptography and its applications, intrusion detection systems. Graduate degree credit will not be given for both CSCE 4853 and CSCE 5853. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 590V. Advanced Individual Study. 1-3 Hour.

Advanced graduate level individual study directed by faculty in current research topics, state of the art, or advanced methodology in one of the major computer science or computer engineering areas. (Typically offered: Irregular)

CSCE 5914. Advanced Digital Design. 4 Hours.

To master advanced logic design concepts, including the design and testing of synchronous and asynchronous combinational and sequential circuits using state of the art CAD tools. Graduate degree credit will not be given for both CSCE 5914 and CSCE 4914 or ELEG 4914 and ELEG 5914. Corequisite: Lab component. Prerequisite: Graduate students majoring in Computer Engineering, Computer Science, or Electrical Engineering. (Typically offered: Irregular)
This course is cross-listed with ELEG 5914.

CSCE 5943. Computer Arithmetic Circuits. 3 Hours.

Examination of fundamental principles of algorithms for performing arithmetic operations in computers. This course provides sufficient theoretical and practical information to prepare the digital design engineer with an awareness of basic techniques for the realization of arithmetic circuits. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5983. Application Specific Integrated Circuit Design. 3 Hours.

ASIC design is taught with emphasis on industrial preparation. Topics include ASIC technologies, design entry, simulation, and synthesis. Advanced design methods and techniques are studied for cell based and gate array ASICs. Prerequisite: CSCE 4213. (Typically offered: Irregular)

CSCE 610V. Master's Thesis. 1-6 Hour.

Master's thesis. (Typically offered: Fall and Spring) May be repeated for degree credit.

CSCE 620V. Post-Master's Research. 1-18 Hour.

Post-master's research. (Typically offered: Fall and Spring)

CSCE 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Construction Management (CSMG)

W. Micah Hale
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Degree Conferred:

M.S. in Construction Management (CSMG)

Program Description: The Department of Civil Engineering offers a Master of Science in Construction Management through a 30-hour online program. The curriculum includes construction scheduling, project finance, construction productivity, construction safety, and legal aspects of construction.

Requirements for M.S. in Construction Management

Program Admission Requirements: Applicants to the program must meet the following admissions requirements. This includes having a bachelor of science, bachelor of arts, or bachelor of architecture from an accredited university. The applicant should have an undergraduate grade point average (GPA) of 3.0 or better (A=4.0) on all course work taken prior to receipt of the bachelor degree, or a GPA of 3.0 or better on the last 60 hours of course work taken prior to receipt of the bachelor degree. An entrance exam, such as the GRE, is not required.

Requirements: In addition to the requirements of the Graduate School, the following requirements have been established by the Construction Management Program. Students must complete a minimum of 30 semester hours of graduate-level credit beyond the bachelor's degree. Students must earn a minimum cumulative grade-point average of 3.00 on all graduate courses attempted. At the completion of their course work, the students must pass a comprehensive final exam.

Course Requirements

CVEG 5503	Construction Safety	3
CVEG 5513	Construction Scheduling	3
CVEG 5523	Construction Productivity	3

CVEG 5533	Legal Aspects of Construction	3
CVEG 5543	Sustainability in Construction Management	3
CVEG 5553	Risk and Financial Management in Construction	3
CVEG 5563	Building Information Modeling (BIM) for Design and Construction	3

Select an additional three courses from any approved Master of Science in Engineering courses offered

Total Hours 30

Counselor Education and Supervision (CNED)

Michael Hevel
 Department Head, Rehabilitation, Human Resources and Communication Disorders
 100 Graduate Education Building
 479-575-4758
 Email: hevel@uark.edu

Kristin Higgins
 Program Coordinator
 106 Graduate Education Building
 479-575-3329
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Degrees Offered:

M.S. in Counseling (CNSL)
 Ph.D. in Counselor Education and Supervision (CNED)

Program Description: The Counselor Education and Supervision program at the University of Arkansas is committed to providing quality education and training for individuals pursuing counseling positions in a variety of settings. The M.S. and Ph.D. degrees are offered through the program. The M.S. degree in counseling offers four concentrations: Clinical Mental Health Counseling, School Counseling, Rehabilitation Counseling, and Addiction Counseling.

Common course requirements are specified for each emphasis. General requirements for M.S. and Ph.D. applicants are as specified in the Objectives, Regulations, and Degrees section of this catalog. Persons completing degrees in counselor education are eligible to apply for licensure as a Professional Counselor through the Board of Examiners in Counseling for the State of Arkansas and/or for various certifications through the State Department of Education and National Board for Certified Counselors. Persons intending to complete school counselor certification requirements for the state of Arkansas must, in addition to the master's degree, meet certain Arkansas Department of Education requirements.

The Counselor Education Program's M.S. in School Counseling, M.S. in Clinical Mental Health Counseling, M.S. in Rehabilitation Counseling and Ph.D. in Counselor Education and Supervision are accredited by the Council for Accreditation of Counseling and Related Education Programs (CACREP).

Areas of Concentration: Clinical mental health counseling, school counseling, rehabilitation counseling, addiction counseling.

M.S. in Counseling with Mental Health Counseling Concentration

Admission Requirements and Procedures for the Master of Science in Counseling Degree Program: Academic requirements include a 3.00

GPA on all undergraduate and also on any previous graduate course work. Applicants should submit a program application, three letters of professional recommendation, and a statement of professional goals to the Coordinator for Graduate Studies (GRAD 116). Applicants should first submit an application and official transcripts to the Graduate School. The applicant must be accepted by the Graduate School prior to consideration for admission into the Counseling Program and meet all graduate school requirements with the exception of standardized tests. Top applicants will be invited for a personal interview with Counselor Education faculty and will be asked to submit a writing sample. Completed application deadlines are September 15 for spring admission and January 15 for summer/fall admission.

Requirements for the Master of Science in Counseling Degree:

Required Core Courses

CNED 5003	Counseling and Human Development	3
CNED 5203	Foundations of the Counseling Profession	3
CNED 5213	Lifestyle & Career Development	3
CNED 5303	Individual Appraisal	3
CNED 5323	Counseling Theory	3
CNED 5333	Basic Counseling Techniques	3
CNED 5353	Psychopharmacology	3
CNED 5363	Dynamics of Group Counseling	3
CNED 5403	Diagnosis and Treatment in Counseling	3
CNED 5513	Counseling and Human Diversity	3
CNED 6023	Foundations of Marriage and Family Counseling Therapy	3
CNED 5483	Counseling Research (or equivalent) or ESRM 5013 Research Methods in Education	3
Total Hours		36

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for the Concentration in Clinical Mental Health Counseling:

The concentration in Clinical Mental Health Counseling requires 60 graduate hours including the core and the following 24 hours:

CNED 5193	Clinical Mental Health Counseling	3
CNED 5343	Counseling Practicum (100 clock hours in a mental health counseling setting)	3
CNED 5373	Ethical and Legal Issues in Counseling	3
CNED 5383	Crisis Intervention Counseling	3
CNED 574V	Counseling Internship (6 semester hours; 600 clock hours in a community setting)	6
CNED 6003	Theories and Foundations of Addictions	3
CNED 6133	Introduction to Play Therapy (or CNED Elective)	3
Total Hours		24

M.S. in Counseling with Rehabilitation Counseling Concentration

Admission Requirements and Procedures for the Master of Science in Counseling Degree Program: Academic requirements include a 3.00 GPA on all undergraduate and also on any previous graduate course work. Applicants should submit a program application, three letters of professional recommendation, and a statement of professional goals to

the Coordinator for Graduate Studies (GRAD 116). Applicants should first submit an application and official transcripts to the Graduate School. The applicant must be accepted by the Graduate School prior to consideration for admission into the Counseling Program and meet all graduate school requirements with the exception of standardized tests. Top applicants will be invited for a personal interview with Counselor Education faculty and will be asked to submit a writing sample. Completed application deadlines are September 15 for spring admission and January 15 for summer/fall admission.

Requirements for the Master of Science in Counseling Degree:

Required Core Courses

CNED 5003	Counseling and Human Development	3
CNED 5203	Foundations of the Counseling Profession	3
CNED 5213	Lifestyle & Career Development	3
CNED 5303	Individual Appraisal	3
CNED 5323	Counseling Theory	3
CNED 5333	Basic Counseling Techniques	3
CNED 5353	Psychopharmacology	3
CNED 5363	Dynamics of Group Counseling	3
CNED 5403	Diagnosis and Treatment in Counseling	3
CNED 5513	Counseling and Human Diversity	3
CNED 6023	Foundations of Marriage and Family Counseling Therapy	3
CNED 5483	Counseling Research (or equivalent) or ESRM 5013 Research Methods in Education	3
Total Hours		36

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for the Concentration in Rehabilitation Counseling:

The concentration in Rehabilitation Counseling requires 60 graduate hours including the core and the following 24 hours:

CNED 5343	Counseling Practicum	3
CNED 5443	Vocational Rehabilitation Foundations	3
CNED 5453	Medical Aspects of Disability	3
CNED 5463	Rehabilitation Case Management	3
CNED 5473	Psychological Aspects of Disability	3
CNED 5583	Placement of Persons with Disabilities	3
CNED 574V	Counseling Internship	6
Total Hours		24

M.S. in Counseling with School Counseling Concentration

Admission Requirements and Procedures for the Master of Science in Counseling Degree Program: Academic requirements include a 3.00 GPA on all undergraduate and also on any previous graduate course work. Applicants should submit a program application, three letters of professional recommendation, and a statement of professional goals to the Coordinator for Graduate Studies (GRAD 116). Applicants should first submit an application and official transcripts to the Graduate School. The applicant must be accepted by the Graduate School prior to consideration for admission into the Counseling Program and meet all graduate school requirements with the exception of standardized tests. Top applicants will be invited for a personal interview with Counselor Education faculty and

will be asked to submit a writing sample. Completed application deadlines are September 15 for spring admission and January 15 for summer/fall admission.

Requirements for the Master of Science in Counseling Degree:

Required Core Courses

CNED 5003	Counseling and Human Development	3
CNED 5203	Foundations of the Counseling Profession	3
CNED 5213	Lifestyle & Career Development	3
CNED 5303	Individual Appraisal	3
CNED 5323	Counseling Theory	3
CNED 5333	Basic Counseling Techniques	3
CNED 5353	Psychopharmacology	3
CNED 5363	Dynamics of Group Counseling	3
CNED 5403	Diagnosis and Treatment in Counseling	3
CNED 5513	Counseling and Human Diversity	3
CNED 6023	Foundations of Marriage and Family Counseling Therapy	3
CNED 5483	Counseling Research (or equivalent)	3
	or ESRM 5013 Research Methods in Education	
Total Hours		36

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for the Concentration in School Counseling:

The concentration in School Counseling requires 60 graduate hours including the core and the following 24 hours:

CNED 5223	Introduction to School Counseling	3
CNED 5313	Program Organization and Information Management	3
CNED 5343	Counseling Practicum (100 clock hours in a school counseling setting)	3
CNED 5383	Crisis Intervention Counseling	3
CNED 574V	Counseling Internship (6 semester hours; 600 clock hours in an elementary or secondary school setting)	6
CNED 6093	Counseling Children and Adolescents Through Play	3
CNED 6133	Introduction to Play Therapy	3
Total Hours		24

Ph.D. in Counselor Education and Supervision

Admission Requirements and Procedures for the Doctor of Philosophy Degree:

Applicants for the doctoral program in counselor education may obtain an application packet from the counselor education Web site: <http://cned.uark.edu>.

Doctoral applicants must:

1. Have a completed master's degree in counseling or its equivalent in areas specified by the Council for Accreditation of Counseling and Related Education Programs (CACREP), and preferably one year post-master's professional counseling experience or the equivalent.
2. Apply to the Graduate School.

3. Submit official transcripts reflecting a minimum 3.5 GPA on all previous graduate work.
4. Submit official GRE scores indicating capacity for doctoral-level performance.
5. Submit three letters of recommendation indicating capacity for advanced graduate study.
6. Submit an autobiographical sketch.
7. Submit a role-play recording demonstrating counseling skills.
8. Top applicants will be invited for a formal interview with the counselor education faculty.
9. All applicants must be accepted by the Graduate School prior to consideration for admission into the Counseling Program.
10. Complete applications are due September 15 for Spring admission and January 15 for Summer/Fall admission.

Requirements for the Doctor of Philosophy Degree: Candidates for the Doctor of Philosophy in counselor education must meet the requirements for the applicable degree in the Objectives, Regulations, and Degrees section of this catalog and complete a minimum of 69 semester hours of graduate study acceptable to their doctoral advisory committee.

Counselor Education Core Courses:

CNED 6013	Advanced Counseling Theory and Methods	3
CNED 6033	Advanced Group Theory and Methods	3
CNED 6043	Supervision of Counselors	3
CNED 6223	Foundations of Counselor Education and Supervision	3
CNED 6343	Cultural Foundations and Counseling	3
CNED 6713	Advanced Counseling Practicum	3
CNED 674V	Internship (RHAB 625V Teaching Internship can count as part of the 6-12 internship hours.)	6-12
CNED 700V	Doctoral Dissertation	18

Select four of the following as a cognate: 12

CNED 6093	Counseling Children and Adolescents Through Play	
CNED 6003	Theories and Foundations of Addictions	
CNED 6133	Introduction to Play Therapy	
CNED 699V	Seminar	
CNED 6243	Disability Policy in the U.S.	
CNED 6253	Advanced Psychosocial Aspects of Disability	
CNED 6233	Employment Practices and Interventions	
HIED 6013	The Professoriate: Problems and Issues	
HIED 6643	College Students in the United States	
HIED 6323	Design and Evaluation of College Teaching	
HIED 6343	Strategies for Effective College Teaching	

Research and Statistics Requirements

CNED 6073	Advanced Research in Counseling	3
ESRM 6403	Educational Statistics and Data Processing	3
ESRM 6413	Experimental Design in Education	3
ESRM 6533	Qualitative Research	3

3 credit hours of statistical elective course approved by the advisory committee 3

Cognate Requirement:

Doctoral students may choose cognate courses (total of 12 credit hours) in the areas of rehabilitation counseling, higher education, clinical

counseling, or student's choice with advisory committee approval. Nine hours of courses must be at the 6000 level.

Other Requirements:

Dissertation (listed above), research and statistics (listed above).

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Doctoral Portfolio

Portfolios are developed with the guidance and approval of the doctoral advisory committee and are due at the time of the student's oral comprehensive examination.

Graduate Faculty

Blisard, Paul, Ed.D. (University of Arkansas), M.C., B.S., B.S. (Southwest Missouri State University), Clinical Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2014.

Christian, David, Ph.D., M.S. (University of North Texas), B.A. (University of Texas at Dallas), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2015.

Higgins, Kristin Kay, Ph.D., M.S. (University of Arkansas), B.A. (Vanderbilt University), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2006.

Perryman, Kristi Leann, Ph.D. (University of Arkansas), M.S., B.S. (Southwest Missouri State University), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2014.

Courses

CNED 5003. Counseling and Human Development. 3 Hours.

This course is intended to give students a broad overview of human nature/behavior through knowledge of lifespan developmental theory, personality development, modern & post-modern approaches to the study of human nature/behavior, and learning theory. Throughout the course, close attention will be given to human ecology or those social/historical/cultural/environmental forces furthering or impeding development. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CNED 5193. Clinical Mental Health Counseling. 3 Hours.

An introductory study of community counseling. The course content includes information concerning the educational, historical, philosophical, and psychological foundations of community counseling as well as specific traits and skills of professional community counselors. In addition, the course is designed to provide introductory level concepts and skills required for future certification and licensure as counseling professionals. Prerequisite: Graduate student status. (Typically offered: Spring)

CNED 5203. Foundations of the Counseling Profession. 3 Hours.

A study of the counseling profession applicable to school, college and community agency settings. Introduction to the basic educational, historical, philosophical foundations of counseling as well as specific traits and skills of counselors. The course is also designed to provide beginning level concepts and skills required for certification and licensure. Prerequisite: Must be taken first year in program. (Typically offered: Fall and Summer)

CNED 5213. Lifestyle & Career Development. 3 Hours.

Theories of career development and counseling, including the use of occupational information sources and career assessment tools and techniques. Prerequisite: CNED 5333. (Typically offered: Summer)

CNED 5223. Introduction to School Counseling. 3 Hours.

Philosophy, organization, and practices of a counseling program in the elementary and secondary school. The school counselor's role as counselor, consultant, and coordinator, professional identity, and legal issues are included. Includes a significant focus on ethical standards and issues. (Typically offered: Irregular)

CNED 5303. Individual Appraisal. 3 Hours.

Analysis of concepts, methods, and procedures utilized in individual appraisal. (Typically offered: Fall)

CNED 5313. Program Organization and Information Management. 3 Hours.

This course addresses needs and strategies for effective development and management of school counseling programs and guidance curriculum. Prerequisite: CNED 5223. (Typically offered: Fall)

CNED 5323. Counseling Theory. 3 Hours.

Introductory survey and critical analysis of major alternative theoretical perspectives in counseling. (Typically offered: Fall and Summer)

CNED 5333. Basic Counseling Techniques. 3 Hours.

Introduction to basic counseling techniques and skills common to multiple theoretical perspectives. Prerequisite: Master's students in Counseling. (Typically offered: Fall and Spring)

CNED 5343. Counseling Practicum. 3 Hours.

Supervised counseling practice. CNED faculty consent required. Pre- or Corequisite: CNED 5303 and CNED 5363 and CNED 5373. Prerequisite: CNED 5203, CNED 5323, CNED 5333, CNED 5403. (Typically offered: Fall and Spring)

CNED 5353. Psychopharmacology. 3 Hours.

Study of theory, research, & practice issues pertaining to psychopharmacology for non-medical practitioners. Prerequisite: CNED 5203, CNED 5323, and CNED 5333. (Typically offered: Summer)

CNED 5363. Dynamics of Group Counseling. 3 Hours.

Therapeutic and other theoretical information is presented regarding group process and the counselor's role in that process. An experiential group experience is required. Prerequisite: CNED 5333 and CNED 5323. (Typically offered: Fall and Spring)

CNED 5373. Ethical and Legal Issues in Counseling. 3 Hours.

Review of ethical and legal standards governing professional counselor training, research, and counseling practice; including client rights; confidentiality; the client-counselor relationship; and counseling research, training, and supervision. Prerequisite: CNED 5003 and CNED 5203. (Typically offered: Fall)

CNED 5383. Crisis Intervention Counseling. 3 Hours.

Analysis and application of short-term counseling intervention strategies in crisis situations, with special attention to incidents involving rape, physical, or emotional abuse, divorce, suicidal depression, grief, marital or family instability, and violent conflict. Prerequisite: CNED 5333. (Typically offered: Summer)

CNED 5403. Diagnosis and Treatment in Counseling. 3 Hours.

Procedures in case management utilizing both clinical and interview data in assisting children, adolescents, and adults in educational, vocational, personal, and social planning. Prerequisite: CNED 5303, CNED 5323 and CNED 5333. (Typically offered: Fall and Spring)

CNED 5443. Vocational Rehabilitation Foundations. 3 Hours.

Survey of the philosophy of vocational rehabilitation, including history and legislation. (Typically offered: Fall)

CNED 5453. Medical Aspects of Disability. 3 Hours.

Orientation to medical and medically related aspects of various disabling conditions with emphasis on the severely disabled. (Typically offered: Spring)

CNED 5463. Rehabilitation Case Management. 3 Hours.

Counseling process in the rehabilitation setting. Focusing upon effective counseling strategies, representative cases, and effective case management methods. (Typically offered: Spring)

CNED 5473. Psychological Aspects of Disability. 3 Hours.

Intensive study of the psychological aspects of adjustment to atypical physique and prolonged handicapping condition. (Typically offered: Spring)

CNED 5483. Counseling Research. 3 Hours.

An in-depth examination of counseling research methodology and issues to prepare students to critically evaluate and use counseling research in their professional practice. (Typically offered: Fall, Spring and Summer)

CNED 5493. Principles and Practices of Psychiatric Rehabilitation. 3 Hours.

The course introduces students to the principles and practices of recovery-oriented, evidence-based psychiatric rehabilitation. Through lectures, guest presentations, films, discussions, and readings, students (a) explore the clinical, psychosocial, and vocational aspects of psychiatric disabilities and (b) examine psychiatric rehabilitation principles and practices to facilitate community integration and successful employment outcomes for individuals with psychiatric disabilities. (Typically offered: Fall)

CNED 5513. Counseling and Human Diversity. 3 Hours.

Examination of human and cultural diversity, emphasizing issues of race, class, and socioeconomic status, and how they impact our clients as individuals and as family and society members. (Typically offered: Summer)

CNED 5523. Process and Behavioral Addictions. 3 Hours.

This course provides an overview of non-substance related addictive disorders such as technology (e.g., video games, Internet, television), gambling, eating, sex, shopping/buying and work as well as potential treatment options for these disorders. (Typically offered: Irregular)

CNED 5533. Introduction to Adventure Therapy. 3 Hours.

This course builds on the foundational understanding of group counseling theory and skills by introducing students to Adventure Therapy (AT), an activity-oriented form of group counseling. Students will integrate previous knowledge pertaining to group counseling with new AT concepts as well as review issues related to current research, best practices, and working with diverse populations. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CNED 5583. Placement of Persons with Disabilities. 3 Hours.

Focuses on placement theory and practice as they apply to persons who experience disabilities. Special attention is given to RehabMark approach. (Typically offered: Summer)

CNED 574V. Counseling Internship. 1-9 Hour.

A 600-clock-hour field placement in an approved setting over a minimum of two continuous semesters. For students completing a counseling internship in a school setting, successful completion of a criminal background check is required before beginning internship. Pre- or Corequisite: CNED 5213. Prerequisite: CNED 5203, CNED 5303, CNED 5323, CNED 5333, CNED 5343, CNED 5363, CNED 5373, CNED 5403, CNED 5513. CNED faculty consent required. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

CNED 599V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CNED 6003. Theories and Foundations of Addictions. 3 Hours.

A study of behavioral and substance addictions, including an overview of differential treatment. Prerequisite: CNED 5323 and CNED 5333, and admission to the CNED masters or doctoral program or departmental consent. (Typically offered: Spring and Summer)

CNED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CNED 6013. Advanced Counseling Theory and Methods. 3 Hours.

Critical analysis of major theoretical perspectives in counseling, including both group and individual counseling strategies for dealing with affective, cognitive, and behavioral dysfunction. Prerequisite: CNED doctoral standing or permission. (Typically offered: Spring Even Years)

CNED 6023. Foundations of Marriage and Family Counseling Therapy. 3 Hours.

Comprehensive exploration of the current theories/techniques of marriage, family and couples counseling. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or permission. (Typically offered: Summer)

CNED 6033. Advanced Group Theory and Methods. 3 Hours.

Comparative study of theories and processes of group counseling. Includes supervised experience in group facilitation with video recording and playback. Prerequisite: CNED 5363 or equivalent and CNED doctoral or masters standing or permission. (Typically offered: Spring Odd Years)

CNED 6043. Supervision of Counselors. 3 Hours.

Analysis, assessment, and practical application of counselor supervision techniques in treatment and training programs. Prerequisite: CNED doctoral standing and CNED faculty consent (Typically offered: Fall Even Years)

CNED 605V. Independent Study. 1-18 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CNED 6073. Advanced Research in Counseling. 3 Hours.

This course involves acquiring a knowledge and understanding of the use of research in counseling and the development of new research in the counseling profession that has heuristic value. Prerequisite: Graduate standing. (Typically offered: Spring)

CNED 6083. Consultation Theory and Methods. 3 Hours.

Strategies, practical application, and techniques for effective consultation with parents, teachers, and community agencies. Prerequisite: CNED 5333 (preferred) CNED doctoral or masters standing or permission. (Typically offered: Summer)

CNED 6093. Counseling Children and Adolescents Through Play. 3 Hours.

Introduction to counseling children and adolescents through play; including the process, theories, techniques, and materials applicable to children and adolescents in a pluralistic society. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or permission. (Typically offered: Spring)

CNED 6133. Introduction to Play Therapy. 3 Hours.

This course is an introduction to the basic concepts of child-centered play therapy (CCPT). Students will learn the conceptual framework of child-centered play therapy, as well as the attitudes and skills necessary to establish and maintain facilitative relationships with children that encourage their self-expression and facilitate change. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or consent. (Typically offered: Irregular)

CNED 6223. Foundations of Counselor Education and Supervision. 3 Hours.

This course is designed to enhance the professional development and acculturation of doctoral students in order to facilitate their success in professional leadership roles of counselor education, supervision, counseling practice, and research competencies. Prerequisite: CNED Doctoral status or permission. (Typically offered: Spring Odd Years)

CNED 6233. Employment Practices and Interventions. 3 Hours.

An intensive study of the employment experiences of workers with disabilities with emphasis on disincentives and barriers to employment and interventions to enable people with disabilities to participate in employment. Prerequisite: Rhab 5493 or equivalent. (Typically offered: Irregular)

CNED 6243. Disability Policy in the U.S.. 3 Hours.

An analysis of public policy approaches to disability in the U.S. Examines the political and philosophical origins of disability policy; reviews major disability legislation and its effects on policy stakeholders; describes recent initiatives; and analyzes evolution of disability policy within context of changing societal, economic, and political conditions. (Typically offered: Fall)

CNED 6253. Advanced Psychosocial Aspects of Disability. 3 Hours.

A theoretical and applied study of techniques that enable people to cope with 2 major life events: disability and unemployment. (Typically offered: Fall Odd Years)

CNED 6343. Cultural Foundations and Counseling. 3 Hours.

To gain learning experiences in pedagogy relevant to multicultural issues and competencies, including social change theory and advocacy action planning. To identify current multicultural issues as they relate to social change theories, ethical and legal considerations, disability, gender, sexuality, social justice, and advocacy models. Prerequisite: CNED or RHAB Doctoral Standing or Permission. (Typically offered: Fall Even Years)

CNED 6713. Advanced Counseling Practicum. 3 Hours.

Supervised counseling practice. A 100-clock hour approved practical counseling experience. Prerequisite: CNED doctoral standing and permission of CNED faculty and Clinical Coordinator. (Typically offered: Spring) May be repeated for up to 3 hours of degree credit.

CNED 674V. Internship. 1-18 Hour.

Supervised field placement (Clinical/Instructorship/Supervision/Research). Prerequisite: CNED doctoral standing, CNED faculty consent and CNED Clinical Coordinator consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CNED 699V. Seminar. 1-18 Hour.

Seminar. Prerequisite: CNED Doctoral standing or permission. (Typically offered: Summer) May be repeated for up to 18 hours of degree credit.

CNED 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy and consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Creative Writing (CRWR)

William A. Quinn
Department Chair, English
331 Kimpel Hall
479-575-4301
Email: engl@uark.edu

Davis McCombs
Program Director
333 Kimpel Hall
479-575-4301
Email: dmccomb@uark.edu

<http://mfa.uark.edu>

Degree Conferred:

M.F.A. (CRWR)

Program Description: The Master of Fine Arts program in Creative Writing offers degree tracks in poetry, fiction, and literary translation as well as the option of a focused study in rhetoric and composition.

The program's 60-hour curriculum enhances the workshop experience with coursework in craft and literary studies so that students develop their own creative voices alongside a deep understanding of the great writers and works that have come before them. The program's small class sizes

and dedicated faculty — award-winning writers themselves — guarantee that students receive hands-on attention through their four years of study.

M.F.A. in Creative Writing

Requirements for the Master of Fine Arts Degree in Creative

Writing: The program leading to the degree of Master of Fine Arts in Creative Writing provides graduate-level training in creative writing and in the study of literature.

Required Courses: 60 hours are required for the M.F.A. degree.

1. Required Writing and Craft Courses
 - a. Writing Workshop (15 to 24 semester hours)
 - b. Craft of Fiction, Poetry, or Translation (9 hours total: 6 hours in student's primary genre; 3 hours in second genre)
 - c. Modern/Contemporary Fiction and Poetry (9 hours total; 6 hours in student's primary genre; 3 hours in second genre)
2. Other Advanced Courses (4000-level or higher): 18-30 hours of literature or approved courses, at least 3 hours of which must be a course that focuses on literature written prior to 1900 and 3 hours of which must be a literature course that emphasizes cultural diversity.
3. Thesis Advising: 6 hours.

Thesis: An M.F.A. thesis may be a collection of poems or stories or a novel. For students whose primary genre is Translation, the thesis will consist of a significant body of work (i.e., poems, stories, or a novel) translated from the original language into English. The thesis should be of the quality of those works currently published by national magazines, by literary journals, and by legitimate book publishers.

Final Examination: Each M.F.A. candidate must pass a one-hour oral examination and defense of the thesis. Awarding of the M.F.A. degree requires approval of the faculty committee.

Grade Requirement: Per Graduate School policy, M.F.A. candidates must present a minimum cumulative grade-point average of 2.85 on all graduate courses required for the degree in order to earn the M.F.A. Failing to earn such an average on the minimum number of hours, the student is permitted to present up to six additional course (not thesis) hours of graduate credit in order to accumulate a grade-point average of 2.85. In the computation of grade point, all courses pursued at this institution for graduate credit (including any repeated courses) shall be considered. Students who repeat a course in an endeavor to raise their grade must count the repetition toward the maximum of six additional hours. If a student encounters academic difficulty after having already completed six credit hours for the degree beyond the minimum degree requirements, no additional hours may be taken. Please note that the Graduate School calculates grade-point average on all graduate-level coursework displayed on the transcript.

All students working toward the degree will plan their specific programs in consultation with their advisers. All degree requirements must be completed within six consecutive calendar years from the date of first enrollment.

Find out more about the program at the Creative Writing website. (<http://mfa.uark.edu/>)

Focused Study in Rhetoric and Composition

Students earning the Master of Fine Arts in Creative Writing may choose Rhetoric and Composition as a field of focused study. Students who choose this option are required to do the following:

1. Take ENGL 5003 Composition Pedagogy; ENGL 5973 Advanced Studies in Rhetoric and Composition or ENGL 6973 Seminar in Rhetoric and Composition; and an additional graduate-level course in Rhetoric and Composition approved by the Director of Composition.

2. Teach five of the following writing courses offered by the English Department:

- Any two courses from Category A
- Any two courses from Category B
- And any additional course from A, B or C

Category A

ENGL 0002, ENGL 0013, ENGL 1013, ENGL 1023, ENGL 1023 (Special Topics)

Category B

ENGL 2003, ENGL 1023, ENGL 1033, ENGL 3053

Category C

ENGL 2013, ENGL 2023, ENGL 3013

3. Earn 10 professional development points from the Program in Rhetoric and Composition by engaging in any combination of the following activities:

- Presenting research at any Rhetoric and Composition conference (three points)
- Organizing or leading a PRC workshop (two points)
- Participating in a PRC workshop (one point)
- Coordinating a PRC course or project (three points)

Graduate Faculty

Brock, Geoffrey Arthur, Ph.D. (University of Pennsylvania), M.F.A. (University of Florida), M.A. (University of Pennsylvania), B.A. (Florida State University), Distinguished Professor, Department of English, 2005.

Davis, Geoffrey, Ph.D., M.F.A., M.A. (Penn State University), B.A. (Oregon State University), Associate Professor, Department of English, 2014.

DuVal, John Tabb, Ph.D., M.F.A., M.A. (University of Arkansas), M.A. (University of Pennsylvania), A.B. (Franklin and Marshall College), Professor, Department of English, 1982.

Jensen, Toni, Ph.D. (Texas Tech University), M.A., B.A. (University of South Dakota), Associate Professor, Department of English, 2014.

McCombs, Davis, M.F.A. (University of Virginia), A.B. (Harvard), Professor, Department of English, 2002.

Viswanathan, Padma, M.F.A. (University of Arizona), M.A. (Johns Hopkins University), B.A. (University of Alberta), Associate Professor, Department of English, 2010.

Crop, Soil and Environmental Sciences (CSES)

Robert Bacon
Department Head
115 Plant Sciences Building
479-575-2354
Email: drkidd@uark.edu

Crop, Soil and Environmental Sciences Website (<http://cses.uark.edu/>)

Degrees Conferred:
M.S., Ph.D. (CSES)

Areas of Study: Crop sciences, soil sciences, and environmental sciences. Areas of specialization within these concentrations include plant breeding and genetics, biotechnology, water quality, environmental science, crop physiology, crop production, weed science, pesticide residue, seed technology, soil chemistry, soil classification, soil fertility, soil microbiology, and soil physics.

Primary Areas of Faculty Research: Environmental, soil, and water science (bioremediation, soil and water quality, microbial ecology, nutrient management, natural resource management using GIS); plant sciences (plant breeding and genetics, plant biotechnology, plant physiology, weed science), and agronomic production science.

Prerequisites to Degree Programs: While extensive undergraduate training in agriculture and physical and biological science is desirable, no specific prerequisites are required. Deficiencies in undergraduate major or prerequisites for advanced courses may be included in the student's program.

M.S. in Crop, Soil and Environmental Science

Requirements for the Master of Science Degree:

Minimum of 24 semester hours of course work as outlined by the student's graduate advisory committee plus six semester hours of thesis credit. The student will be given an oral examination after the thesis is completed.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Crop, Soil and Environmental Science

Requirements for the Doctor of Philosophy Degree: After a student has been admitted to the Graduate School and accepted by the department as being qualified for advanced work, the student is assigned to a major adviser. The major adviser will, in consultation with the department head, select a graduate committee. This committee will serve both in an advisory capacity for the student's program and as the dissertation and examination committee. The student's graduate advisory committee will determine the number of hours of course work to be completed for the degree.

The student must take candidacy examinations (prelims) in at least five fields of study after completing approximately two years of graduate study and at least one year before completing all other requirements. Preliminary examinations must be written and oral. Further details regarding requirements for the Doctor of Philosophy degree are available in the department office.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

B

Bacon, Robert Keith, Ph.D. (Purdue University), M.S., B.S.A., (University of Arkansas), Professor, 1984.

Barber, Thomas, Ph.D., M.S., B.S. (University of Arkansas), Professor, 2007.

Bourland, Fred, Ph.D. (Texas A&M University), M.S., B.S.A. (University of Arkansas), Professor, 1988.

Brye, Kristofor R., Ph.D., M.S. (University of Wisconsin-Madison), B.S. (University of Wisconsin-Stevens Point), University Professor, 2001.

Burgos, Nilda Roma, Ph.D., M.S. (University of Arkansas), B.S. (Visayas State College of Agriculture-Philippines), Professor, 1998.

Butts, Thomas R., Ph.D. (University of Nebraska-Lincoln), Assistant Professor, 2019.

C

Counce, Paul Allen, Ph.D. (University of Georgia), M.S. (Purdue University), B.S. (University of Tennessee-Martin), Professor, 1983.

D

Daniels, Michael B., Ph.D., M.S. (University of Arkansas), B.S. (Pennsylvania State University), Professor, 1996.

E

Espinoza, Leonel A., Ph.D., M.S. (University of Florida), B.S. (Iowa State University), Associate Professor, 2003.

G

Gbur, Edward E., Ph.D., M.S. (The Ohio State University), B.S. (Saint Francis University), Professor, 1987.

H

Hardke, Jarrod T., Ph.D. (Louisiana State University), B.S.A. (University of Arkansas), Professor, 2013.

K

Kelley, Jason, Ph.D., M.S. (Oklahoma State University), B.S. (Kansas State University), Professor, 2003.

M

Mason, Richard Esten, Ph.D., B.A. (Texas A&M University), Associate Professor, 2010.

Mauromoustakos, Andy, Ph.D., M.S. (Oklahoma State University), B.S. (Oral Roberts University), Professor, 1989.

Miller, David M., Ph.D. (University of Georgia), M.S., B.S. (Purdue University), Professor, 1988.

Mozaffari, Morteza, Ph.D. (University of Delaware), M.S., B.S. (University of Massachusetts), Assistant Professor, 2002.

N

Norsworthy, Jason Keith, Ph.D., M.S. (University of Arkansas), B.S. (Louisiana Tech University), Distinguished Professor, 2006.

P

Pereira, Andy, Ph.D. (Iowa State University), M.S. (Indian Agricultural Research Institute, India), B.Sc.Ag. (Govind Ballabh Pant University of Agriculture and Technology, India), Professor, 2011.

Purcell, Larry C., Ph.D. (University of Florida), M.S., B.S. (University of Georgia), Distinguished Professor, 1993.

R

Roberts, Trenton L., Ph.D. (University of Arkansas), M.S. (University of Arizona), B.S. (Oklahoma State University), Associate Professor, 2010.

Robertson, Bill, Ph.D., M.S. (Texas A&M University), B.S. (West Texas State University), Professor, 2014.

Ross, Jeremy, Ph.D, M.S., B.S. (University of Arkansas), Professor, 1996.

S

Savin, Mary Cathleen, Ph.D., M.S. (University of Rhode Island), B.S. (University of Notre Dame), Professor, 2002.

Scott, Robert C., Ph.D. (Mississippi State University), M.S., B.S. (Oklahoma State University), Professor, 2002.

Sha, Xueyan, Ph.D. (Louisiana State University), Professor, 2012.

Shakiba, Ehsan, Ph.D., M.S. (University of Arkansas), M.S., B.S. (Azad University, Iran), Assistant Professor, 2015.

Sharpley, Andrew N., Ph.D. (Massey University, New Zealand), B.S. (University College of North Wales), Distinguished Professor, 2006.

Skinner, Jerral V., Ph.D. (University of Arkansas), Lecturer, 1990.

Slaton, Nathan A., Ph.D., M.S. (University of Arkansas), B.S. (Murray State University), Professor, 2001.

Srivastava, Vibha, Ph.D. (Jawaharlal Nehru University, New Delhi), M.S. (Govind Ballabh Pant University of Agriculture and Technology), B.S. (D.E.I. University), Professor, 2001.

W

Wilson, Charles E., Ph.D., M.S. (University of Arkansas), B.S. (Arkansas State University), Professor, 2011.

Wood, Lisa S., Ph.D., M.S., B.S. (University of Arkansas), Clinical Associate Professor, 2012.

Courses

CSES 5001. Weed Science Practicum. 1 Hour.

Training for membership on weed team, through participation. Prerequisite: Graduate standing. (Typically offered: Summer)

CSES 5013. Crop Physiology. 3 Hours.

Understanding and quantitative measurement of physiological processes, plant responses, and environmental parameters in relation to the production of crops. Prerequisite: BIOL 4303. (Typically offered: Spring Even Years)

CSES 5023. Physiology of Herbicide and Plant Interaction. 3 Hours.

The reproduction, growth, and development of weeds and the ecological factors affecting these processes; development and mechanisms of herbicide resistance, flow of herbicide-resistance genes; and development of herbicide-resistant crops. Corequisite: Lab component. Prerequisite: CSES 4143 or CSES 5143 (formerly CSES 4143) and (BIOL 4303 or CHEM 5813). (Typically offered: Spring Odd Years)

CSES 502V. Special Problems Research. 1-6 Hour.

Original investigations on assigned problems in agronomy. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CSES 5033. Advanced Soil Fertility and Plant Nutrition. 3 Hours.

Study of water uptake, ion absorption, translocation and metabolism in higher plants. Lecture 3 hours per week. Prerequisite: BIOL 4303 and CHEM 2613 and CHEM 2611L. (Typically offered: Spring Even Years)

CSES 504V. Special Topics. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in agronomy. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

CSES 5073. Advanced Crop Science. 3 Hours.

Fundamental concepts of crop physiology, crop improvement, seed science, and crop production systems. Recitation 3 hours per week. Graduate degree credit will not be given for both CSES 4013 and CSES 5073. (Typically offered: Fall)

CSES 5093. Plant Breeding. 3 Hours.

(Formerly CSES 4103.) Basic principles involved in plant breeding programs to improve crop plants and seed programs. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4103 and CSES 5093. Corequisite: Lab component. Prerequisite: ANSC 3123 or BIOL 2323. (Typically offered: Fall Even Years)

CSES 5103. Scientific Presentations. 3 Hours.

Experience in procedures required for professional presentations of scientific papers, seminars, posters; and research findings at meetings in conferences, and with discussion groups. Instruction in organization of materials, visual aids, and good speaking habits. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall)

CSES 5114. Soil Fertility. 4 Hours.

Study of the soil's chemical, biological and physical properties, and human modification of these properties, as they influence the uptake and utilization of the essential nutrients by plants. Lecture 3 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4224 and CSES 5114. Corequisite: Lab component. (Typically offered: Fall)

CSES 5133. Ecology and Morphology of Weedy and Invasive Plants. 3 Hours.

(Formerly CSES 4133.) Study of weeds as economic pests occurring in both agricultural and nonagricultural situations and including poisonous plants and other specific weed problems. Gross morphological plant family characteristics which aid identification, habitat of growth and distribution, ecology, competition, and allelopathy are discussed. Lecture 2 hours, laboratory 2 hours a week. Graduate degree credit will not be given for both CSES 4133 and CSES 5133. Corequisite: Lab component. Prerequisite: CSES 2103 or HORT 2003. (Typically offered: Fall)

CSES 5143. Principles of Weed Control. 3 Hours.

(Formerly CSES 4143.) Advanced concepts and technology used in modern weed control practices and study of the chemistry and specific activity of herbicides in current usage. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4143 and CSES 5143. Corequisite: Lab component. Prerequisite: CHEM 1073 and CHEM 1071L. (Typically offered: Spring)

CSES 5214. Analytical Research Techniques in Agronomy. 4 Hours.

Preparation and analysis of plant and soil samples utilizing spectrophotometry, isotopes, and chromatographic separation methods. Additionally, measurements are made of photosyntheses, respiration, water relationships, light, and temperatures in whole plants. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Lab component. Prerequisite: BIOL 4303 and CHEM 2613 and CHEM 2611L. (Typically offered: Fall Even Years)

CSES 5224. Soil Physics. 4 Hours.

Physical properties of soils and their relation to other soil properties, growth of plants and transport of water, oxygen, heat, and solutes such as pesticides and plant nutrients. Lecture 3 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CSES 2203 and MATH 1203. (Typically offered: Spring)

CSES 5233. Plant Genetic Engineering. 3 Hours.

Topics will be covered in the field of in vitro plant biology, transgene genetics and crop genetic engineering. Concepts and applications of transgenic plant technology will be discussed, with the emphasis on the strategies for crop improvement and gene discovery. Lecture 3 hours. (Typically offered: Spring Odd Years)

CSES 5253. Soil Classification and Genesis. 3 Hours.

(Formerly CSES 4253.) Lecture and field evaluation of soil properties and their relation to soil genesis and soil classification with emphasis on soils of Arkansas. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4253 and CSES 5253. Corequisite: Lab component. Prerequisite: CSES 2203 and CSES 2201L. (Typically offered: Fall Odd Years)

CSES 5264. Microbial Ecology. 4 Hours.

A study of the microorganisms in soil and the biochemical processes for which they are responsible. Lecture 3 hours, laboratory 3 hours per week. Additional suggested prerequisites are BIOL 2013, CSES 2203, and ENSC 3003. Corequisite: Lab component. Prerequisite: BIOL 1543 and BIOL 3863 or ENSC 3223. (Typically offered: Fall Odd Years)

CSES 5303. Bioenergy Feedstock Production. 3 Hours.

(Formerly CSES 4303.) Overview of production and characteristics of cultivated crops, perennial grasses, and woody species as feedstocks for bioenergy. Fundamentals of plant growth factors, culture, harvest and storage, quality and improvement, and introduction to environmental impact, modeling, and resource utilization. Graduate degree credit will not be given for both CSES 4303 and CSES 5303. Prerequisite: MATH 1203 and BIOL 1543 or CSES 1203. (Typically offered: Spring)

CSES 5323. Soil/Water Quality in Bioenergy Feedstock Production Systems. 3 Hours.

Examine concepts of soil and water quality in relation to bioenergy feedstock production, explore research related to biomass removal and by-product addition to soils, and examine the potential effects of proposed feedstock production systems on soil and water quality. Prerequisite: MATH 1203 and CSES 2203 or equivalent or consent of instructor, and CSES 4303 or CSES 5303 (formerly CSES 4303) preferred. (Typically offered: Fall Odd Years)

CSES 5453. Soil Chemistry. 3 Hours.

Application of the principles of chemistry to processes of agronomic and environmental importance in soils. Soil clay mineralogy, soil solution thermodynamics, structure and reactivity of humus, surface complexation and ion exchange, electro-chemical phenomena, and colloidal stability. Prerequisite: CSES 2203 and CHEM 1123 and CHEM 1121L. (Typically offered: Fall Even Years)

CSES 5533. Wetland Soils. 3 Hours.

(Formerly CSES 4553.) This course explains the chemical, physical, and morphological characteristics of wetland soils and describes the techniques for identifying wetland soils using field indicators and monitoring equipment. This course also explains principles of wetland creation, restoration, and mitigation - all key components in assuring the sustainability of valuable wetland resources. Graduate degree credit will not be given for both CSES 4553 and CSES 5533. Prerequisite: CSES 2203 and CSES 2201L or CSES 355V. (Typically offered: Spring Odd Years)

CSES 5543. Plant Genomics. 3 Hours.

Plant genetics based on the study of whole genome sequence, transcriptome and proteome. Provides an overview of the principles and techniques of experimental and in silico genomics. Covers all areas of genome research including structural, comparative and functional genomics as well as proteomics. Prerequisite: CHEM 5843 or any graduate level genetics course. (Typically offered: Spring Even Years)

CSES 5553. Forage-Ruminant Relations. 3 Hours.

Advanced chemical, physical, and botanical characteristics of forage plants, the dynamics of grazing, intake and digestion, and techniques of measuring forage utilization and systems analysis at the plant-animal interface. CSES 1203 recommended. Corequisite: Lab component. Prerequisite: ANSC 3143. (Typically offered: Spring Odd Years)

This course is cross-listed with ANSC 5553.

CSES 5653. Fate and Transport of Organic Contaminants. 3 Hours.

Fate and Transport of Organic Contaminants will present an overview of the transformation and transport processes that influence the environmental fate of organic contaminants, with an emphasis on agricultural pesticides. Biotic and abiotic factors influencing the movement and behavior of organic contaminants in soil and water will be covered extensively, with an emphasis on chemical mechanisms. Prerequisite: CHEM 1123 and CHEM 1121L and CSES 2203, or instructor consent. (Typically offered: Spring Odd Years)

CSES 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CSES 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Curriculum and Instruction (CIED)

Ed Bengtson
Department Head
216 Peabody Hall
479-575-4209
Email: egbengts@uark.edu

Jason Endacott
 Graduate Coordinator
 216 Peabody Hall
 479-575-4209
 Email: jendacot@uark.edu

Department of Curriculum and Instruction website (<http://cied.uark.edu/>)

Degrees Conferred:

M.A.T. in Elementary Education (p. 124) (ELED)
 M.A.T. in Teacher Education (p. 321) (EDUC)
 M.Ed. in Curriculum and Instruction (CIED)
 M.Ed. in Career and Technical Education (p. 55) (CATE)
 M.Ed. in Educational Equity (p. 111) (EDEQ)
 M.Ed. in Educational Leadership (p. 113) (EDLE)
 M.Ed. in Educational Technology (p. 118) (ETEC)
 M.Ed. in Special Education (p. 310) (SPED)
 M.Ed. in Teaching English to Speakers of Other Languages (p. 323) (TESL)
 Ed.S. in Curriculum and Instruction (CIED)
 Ed.S. in Educational Leadership (p. 113) (EDLE)
 Ed.D. in Educational Leadership (p. 113) (EDLE)
 Ph.D. in Curriculum and Instruction (CIED)

Graduate Certificates Offered (non-degree):

Applied Behavior Analysis (p. 310) (APBA)
 Arkansas Curriculum/Program Administrator (p. 113) (ACPA)
 Autism Spectrum Disorders (p. 310) (AUTS)
 Building-Level Administration (p. 113) (PSBL)
 District-Level Administration (p. 113) (PSDL)
 STEM Education for Early Childhood (p. 349) (K-4) (STEM)

Additional Licensing Programs (ALP)

Middle-Level Education
 Special Education (P-Grade 4)
 Special Education (Grades 4-12)

Program Description: Graduate programs in the Department of Curriculum and Instruction focus upon advanced preparation of practitioners who may serve in a variety of roles in K-12 schools, higher education, business, industry and clinical settings. Degrees and certificate programs focus on providing initial and/or additional licensure for teaching and educational leadership in K-12 schools. In addition doctoral degrees prepare practitioners for research, teaching and service roles in public education and/or higher education or positions with state, federal or community educational organizations.

Primary Areas of Faculty Research: The research areas of faculty vary widely based upon their area of expertise. Individual lines of inquiry range from a focus upon K-20 student, teacher, administrator and practitioner preparation and effectiveness, to content specific inquiry within the various sub-disciplines. Additional research areas cross disciplines with a focus on clinical applications and therapeutic interventions as well.

M.Ed. in Curriculum and Instruction

The M.Ed. in Curriculum and Instruction provides additional preparation for individuals who currently hold teaching credentials or for those who wish to further their professional development in specific content area or education-related field.

Admission to the Master's Degree: Students must apply to the UA Graduate School before consideration for admission. In addition to those requirements, students must provide two letters of recommendation and a personal statement. This statement should discuss their reasons

for pursuing the degree as well as a discussion of an area of curricular interest, which will be the focus of their program of study. Students should have at least two years of experience in an education related field before beginning the M.Ed. program.

Requirements for the Master of Education Degree (33 hours):

Required Courses

Research Tools and Foundations (9 credits)

Choose one of the following:

CIED 5013	Measurement, Research and Statistical Concepts in the Schools
CIED 5273	Research in Curriculum and Instruction
CIED 5983	Practicum in Curriculum & Instruction

Choose one of the following:

ESRM 5393	Statistics in Education and Health Professions
ESRM 6533	Qualitative Research

Psycho-Sociological Foundations (6 credits)

CIED 5053	Multicultural Issues in Elementary Education	3
EDFD 5373	Psychological Foundations of Teaching and Learning	3

Pedagogical Foundations (6 credits)

ETEC 5303	Teaching with Technology in the K-12 Classroom	3
CATE 5543	Technology for Teaching and Learning	3

Interest Areas (All M.Ed. students must choose an interest area)(9 hours minimum)

Elementary Education

CIED 5173	Literacy Assessment and Intervention	3
CIED 5853	Issues in Mathematics Education	3
CIED 6343	Advanced Science Teaching Methods	3

Gifted Education (9 hours basic program or 18 hours with endorsement)

CIED 6073	Seminar in Developing Creativity	3
CIED 6143	Differentiated Instruction for Academically Diverse Learners	3
CIED 6163	Social and Emotional Components of Gifted and Talented Students	3

Note: Individuals with a valid teaching certificate may take the following three additional courses in this area to earn an endorsement in Gifted and Talented Education. Please see adviser regarding this option.

CIED 5803	Nature and Needs of the Gifted and Talented
CIED 5813	Curriculum Development in Gifted and Talented
CIED 5823	Gifted and Talented (Structured) Practicum

TESOL (9 hours basic or 12 hours with endorsement)

Choose three of the following:

CIED 5923	Second Language Acquisition	3
CIED 5933	Second Language Methodologies	3
CIED 5943	Teaching People of Other Cultures	3
CIED 5953	Second Language Assessment	3

Note: Individuals with a valid teaching certificate may take all four classes listed and earn an endorsement in English as a Second Language (ESL). Please see adviser regarding this option.

English Education

CIED 5843	Representations of American Education in Film	3
CIED 5983	Practicum in Curriculum & Instruction (Adolescent Literature)	3
ENGL 5973	Advanced Studies in Rhetoric and Composition	3
CIED 599V	Special Topics (Issues and Trends in Literacy Education)	1-18

Science Education

CIED 6313	Issues, History, and Rationale of Science Education	3
CIED 6333	Nature of Science: Philosophy of Science for Science Educators	3
CIED 6343	Advanced Science Teaching Methods	3

Social Studies Education

Select a minimum of 9 credit hours of coursework in social studies education as approved by the advisory committee. 9

Integrated STEM Education

STEM 5033	Introduction to STEM Education	3
STEM 5023	Creativity and Innovation in STEM	3
STEM 5203	Problem-Based Mathematics	3
STEM 5213	Teaching Problem-Based Science in the Elementary Grades	3

Research Requirement for the M.Ed. Degree: Students are not required to complete a formal master's thesis but will take a class (such as CIED 5013 or CIED 5273) that provides an introduction to education research and then design and carry out an action research project in CIED 5983 Practicum in Curriculum & Instruction. Following this two-course sequence, students will defend their project as the comprehensive exam for the degree. This project will be assessed by a faculty panel which will include the adviser for the student's program and two other M.Ed. faculty members.

For students who have the experience and desire necessary to complete a formal thesis, this option exists. In such cases, students will form an advisory committee and then propose, write, and defend a thesis project. The successful defense of the thesis will represent the comprehensive exam for the M.Ed. degree. Students who choose the thesis option are not required to complete CIED 5013 or CIED 5273 or CIED 5983, but must take six hours of master's thesis credit (CIED 600V) in place of these two courses.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ed.S. in Curriculum and Instruction

Admission to the Program: Students must meet the admission requirements of the Graduate School. The criteria for admission to the CIED Ed.S. program includes an earned master's degree from a regionally accredited U.S. institution with a cumulative grade point average of 3.25 or better on a 4.0 scale. Transcripts will be required. In addition, students must demonstrate evidence of two years of successful, full-time professional experience, or equivalent, in an area related to the student's academic goals. Students must apply for both the Ed.S. in CIED and the Graduate Certificate they wish to complete (either Arkansas Curriculum/Program Administrator or K-12 Online Teaching). After admission to the Graduate School, the application is reviewed by the Curriculum and Instruction Ed.S. Admissions Committee for admission

into the CIED Ed.S. Program. Admission is based on the profile of applicant educational background and career objectives.

Program Requirements: The program of study for the Ed.S. in Curriculum and Instruction consists of a minimum of 33 semester hours of graduate work beyond the master's degree. Each Ed.S. student must complete 2 coursework blocks based on their desired goal. Each student is also required to complete 3 semester hours of CIED 680V Ed.S. Project, which is an investigation or inquiry that demonstrates their capacity to design, implement and evaluate an intervention independently. A grade-point average of 3.25 is required for the Educational Specialist degree program on all graduate hours completed.

Students should also be aware of Graduate School requirements with regard to specialist degrees (p. 456).

Coursework Block Combinations per Student's Goal

Complete all courses in one of the following combinations:	
Curriculum/Program Administrator: CIED and EDLE	
Special Education Program Administrator: SPED and EDLE	
K-12 Online Teaching Graduate Certificate: CIED and ETEC	
CIED: Curriculum and Instruction Course Block	15
CIED 5423	Curriculum and Instruction: Models and Implementation
CIED 6013	Curriculum Theory, Development, and Evaluation
CIED 5363	Teaching in K-12 Online and Blended Classrooms
CIED 6053	Curriculum and Instruction: Learner Assessment and Program Evaluation
CIED 5983	Practicum in Curriculum & Instruction
EDLE: Educational Leadership Course Block	15
EDLE 5013	School Organization and Administration
EDLE 5043	Leadership Ethics
EDLE 5063	Instructional Leadership, Planning, and Supervision
EDLE 5083	Analytical Decision-Making
EDLE 5093	Effective Leadership for School Improvement
SPED: Special Education Course Block	15
SPED 5733	Inclusive Practices for Diverse Populations
SPED 5783	Professional and Family Partnerships
SPED 5893	Organization, Administration and Supervision of Special Education
SPED 6433	Legal Aspects of Special Education
SPED 532V	Practicum in Special Education
ETEC: K-12 Online Teaching Course Block	15
ETEC 5213	Designing Educational Media
ETEC 5303	Teaching with Technology in the K-12 Classroom
ETEC 6253	Teaching and Learning at a Distance
ETEC 5313	Principles in Visual Literacy
ETEC 6243	Advanced Instructional Design
Ed.S. Project Requirement	3
CIED 680V	Ed.S. Project

Ph.D. in Curriculum and Instruction

The Ph.D. in Curriculum and Instruction is a post master's degree that focuses upon the development of theoretical knowledge, research skills and the application of research in guiding investigations and improving practice. This degree provides advanced study and preparation for

individuals who wish to pursue roles as higher education professors and/or researchers and/or serve in a leadership role in a variety of educational/clinical settings.

Admission to the Ph.D. Program in Curriculum and Instruction

Students must first apply to the UA Graduate School and then to the Department of Curriculum and Instruction where the final admission decision is made by the following deadlines:

- December 1 - Fall admission for students seeking Graduate Assistantships
- April 1 - Summer admission or fall admission for students not seeking Graduate Assistantships
- October 1 - Spring Admission

The decision to admit a student to graduate study particularly at the PhD level is multi-faceted. It involves not only a review of the students' qualifications but also the department's capacity to help each student achieve their specific personal and career goals. We expect our successful applicants to have an earned master's degree and a solid GPA and GRE scores at or above the 50th percentile (approximately 149 in Quantitative and 151 Verbal Reasoning). However, the final decision is not based solely on any single indicator, but rather through a holistic evaluation of the potential student's application materials. Students bypass full Ph.D. Admission Committee review if they meet the following minimum criteria:

- GRE Scores at the 50th percentile or above in all three areas
 - Quantitative
 - Verbal
 - Writing
- Master's degree G.P.A. of 3.5 or above
- An available faculty mentor in the desired area of interest
- Minimum of three years full-time professional teaching experience, clinical experience, or equivalent employment experiences prior to the application to the doctoral program.
- Favorable faculty mentor reviews of:
 - Writing sample which demonstrates professional writing competency
 - Letters of recommendation
 - Three years of field related experience in the desired area of interest

Students who do not meet these minimum requirements can still be admitted if their applications are approved by the Ph.D. Admissions Committee. Review by the Graduate Admissions Committee is required for any student who wishes to be considered for a Graduate Assistantship/Fellowship. Graduate Assistantships are awarded by the CIED Department Head in consultation with the Ph.D. Admissions Committee. GA positions are limited, and are not necessarily available to the department each year. Preference is given to candidates

who would also have a strong case for a Doctoral Fellowship. More information regarding the fellowships is available here (<http://graduate-recruitment.uark.edu/funding-degree/fellowships.php>).

In addition to the Graduate School application requirements, students applying for the Ph.D. in Curriculum and Instruction must also submit the following through the application portal:

1. Resume or CV: Current resume or CV that outlines prior educational and professional experience.
2. Statement of Purpose: Brief personal narrative that describes applicants's personal, educational, and professional goals. Statements of Purpose typically include educational interests, future career plans, research interests, and a description of how a Ph.D. in Curriculum and Instruction will facilitate those goals.
3. Writing Sample: Original writing sample (20 page maximum) that illustrates applicant's ability to communicate in a clear and creative fashion. Writing samples can take many forms, both educational and professional, as long as they provide the department with an accurate representation of the applicant's writing style and ability.

Requirements for the Doctor of Philosophy Degree

Candidates for the Doctor of Philosophy degree must meet the general University degree requirements and complete a minimum of 102 semester hours of graduate study approved by the Doctoral Advisory Committee. The program of study for the Doctor of Philosophy candidate must include the following:

Approved Master degree program	33
Curriculum and Instruction Core Courses	12
CIED 6013	Curriculum Theory, Development, and Evaluation
CIED 6023	Instructional Theory
6 hours chosen from:	
CIED 6043	Analysis of Teacher Education
or CIED 605	Curriculum and Instruction: Learner Assessment and Program Evaluation
or CIED 613	Trends and Issues in Curriculum and Instruction
or CIED 660	Multicultural Education
Inquiry Core Courses	15
ESRM 6403	Educational Statistics and Data Processing
CIED 5313	Principles of Qualitative Research in Curriculum & Instruction
CIED 6443	Mixed Methods Research
ESRM 6413	Experimental Design in Education
3 hours 5000-/6000-level inquiry course ¹	
Research Capstone	6
CIED 674V	PhD Research Internship
CIED 6623	Research Methods and Scholarship in Curriculum and Instruction
Electives from student's area of interest in CIED	9
Educational Technology	
English Education	
Gifted Education	
Literacy	
Math Education	

Science Education	
Social Studies Education	
TESOL	
Cognate coursework ¹	9
Dissertation ²	18
CIED 700V	Dissertation
<hr/>	
Total Hours	102

¹ As approved by Doctoral Advisory Committee.

² Students must be continuously enrolled after successful completion of candidacy exam and must be enrolled in at least one dissertation credit during term in which dissertation is defended.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

B

Barth, Daniel, Ph.D., M.A. (Claremont Graduate University), B.S. (Eureka College), Assistant Professor, 2014.

Beasley, Jennifer G., Ed.D. (University of Virginia), M.A. (Wichita State University), B.A. (Kansas State University), Clinical Associate Professor, 2009.

Beck, Dennis E., Ph.D. (University of Florida), B.S. (Pennsylvania State University), Associate Professor, 2010.

Bell, Karmen V., M.Ed. (Indiana Wesleyan University), Clinical Instructor, 2015.

Bell, Kathryn M., Ph.D. (University of Pittsburgh), Lecturer, 2019.

Bengtson, Ed, Ph.D. (University of Georgia), Ed.S. (George Washington University), M.A. (California State University-Sacramento), B.S. (Pennsylvania State University), Associate Professor, 2010.

Blair, Alissa, Ph.D. (University of Wisconsin-Madison), M.E.D. (University of Notre Dame), B.A. (Saint Mary's College), Assistant Professor, 2020.

Bowles, Freddie A., Ph.D., M.A. (University of Arkansas), B.A. (Arkansas State University), Associate Professor, 2004.

Brady, Kevin P., Ph.D. (University of Illinois-Champaign-Urbana), M.A. (Columbia University), B.A. (Binghamton University), Associate Professor, 2014.

Burgin, Stephen, Ph.D., Ed.S., M.Ed., B.S. (University of Florida), Assistant Professor, 2014.

Burks, Lizette Anita, Ed.D. (University of Kansas), Instructor, 2019.

C

Carter, Vinson R., Ph.D., M.A.T., B.S. (University of Arkansas), Associate Professor, 2008.

Collet, Vicki S., Ph.D. (State University of New York at Buffalo), M.A. (University of Northern Colorado), B.A. (University of Utah), Associate Professor, 2012.

Collins, Kathleen, Ph.D., M.A., B.A. (University of California-Santa Barbara), Professor, 2002.

Connors, Sean P., Ph.D. (The Ohio State University), M.S. (Elmira College), B.A. (SUNY Geneseo), Associate Professor, 2010.

D

Daugherty, Michael, Ed.D., M.S., B.S. (Oklahoma State University), Professor, 2005.

Deaton, Sheri, M.A.T., B.S. (University of Arkansas), Instructor, 2016.

Diaz, Eva I., Ph.D., M.Ed. (Pennsylvania State University), B.A. (University of Puerto Rico), Research Associate, 2014.

E

Eilers, Linda Hale, Ph.D. (Louisiana State University at Shreveport), M.Ed., B.S.E. (University of Arkansas at Little Rock), Clinical Associate Professor, 2001.

Elsass, Angela Carlton, Ed.D., Ed.S. (University of Arkansas), M.Ed. (Harding University), B.S.E. (University of Central Arkansas), Clinical Associate Professor, 2010.

Endacott, Jason L., Ph.D., M.S. (University of Kansas), B.S. (Kansas State University), Associate Professor, 2011.

G

Gethers, Katchia, Ed.D. (John Hopkins University), Lecturer, 2019.

Goering, Christian Z., Ph.D., M.S. (Kansas State University), B.A. (Washburn University), Professor, 2007.

Greene, Aleza R.S., Ph.D., M.A. (Brandeis University), B.A. (Tufts University), Clinical Assistant Professor, 2006.

H

Holland, Beth, Ed.D. (John Hoskins University), Lecturer, 2019.

Hutchins, Rhett J., Ph.D. (University of Georgia), M.Ed., B.S. (Clemson University), Clinical Assistant Professor, 2014.

I

Imbeau, Marcia B., Ph.D. (University of Connecticut), M.Ed. (University of Arkansas at Little Rock), B.A. (Hendrix College), Professor, 1991.

J

Johnson-Carter, Charlene M., Ph.D. (Emory University), M.B.A. (Atlanta University), M.Ed., B.A. (University of Cincinnati), Associate Professor, 1992.

Jones, Clinton G., Ed.D. (Arkansas Tech University), Ed.S. (Harding University), Assistant Professor, 2019.

K

Kent, Laura B., Ph.D. (University of Wisconsin-Madison), M.S. (Purdue University Calumet), B.S. (Purdue University), Associate Professor, 2006.

Kerr, Grace R., M.A. (Texas A&M University), B.A. (Sam Houston State University), Clinical Instructor, 2006.

King, Bonnie, M.A.T., B.S.E. (University of Arkansas), Clinical Instructor, 2015.

Kucharczyk, Suzanne, Ed.D. (Columbia University Teacher's College), M.Ed., B.S. (University of Illinois-Urbana-Champaign), Assistant Professor, 2014.

L

Lasater, Kara A., Ed.D. (University of Arkansas), Ed.S., M.S. (Pittsburg State University), B.A. (Drury University), Assistant Professor, 2014.

Lopez, Trish A., M.A.T. (Arkansas Tech University), Research Associate, 2020.

Lorah, Elizabeth R., Ph.D., M.S.Ed., B.A. (Temple University), Associate Professor, 2013.

M

Mayes, Eric, Ph.D. (Howard University), Associate Professor, 2019.

McComas, Kim Krusen, Ph.D. (University of Arkansas), M.A. (West Chester University of Pennsylvania), B.A. (University of Arizona), Teaching Assistant Professor, 2012.

McComas, William, Ph.D. (University of Iowa), M.S. (West Chester University of Pennsylvania), B.S. (Lock Haven University of Pennsylvania), Distinguished Professor, 2006.

Mears, Derrick, Ph.D. (University of Arkansas), M.S., B.S. (University of Central Missouri), Teaching Associate Professor, 2014.

Mounds, Denise Ann, Ed.D. (Saint Louis University), B.S.E. (Northwest Missouri State University), Clinical Associate Professor, 2005.

Murphy, Cheryl Ann, Ed.D., M.A., B.A. (West Virginia University), Professor, 1996.

N

Norwood, Demeka L., Ph.D. (University of Missouri), Lecturer, 2019.

O

Ogilvie, Christine R., Ph.D. (University of Central Florida), Lecturer, 2019.

Orr, Betsy, Ed.D., M.Ed. (University of Arkansas), B.A. (University of Arkansas at Monticello), Associate Professor, 1989.

Owen, Donna S., M.S., B.S., B.A. (University of Arkansas), Clinical Instructor, 2005.

P

Penner-Williams, Janet, Ed.D., M.Ed., B.S.E. (University of Houston), Associate Professor, 2005.

Pijanowski, John C., Ph.D., M.S. (Cornell University), B.A. (Brown University), Professor, 2007.

R

Ralston, Christine R., Ph.D. (Purdue University), M.Ed., B.S. (Indiana Wesleyan University), Clinical Assistant Professor, 2015.

S

Schaefer-Whitby, Peggy, Ph.D. (University of Central Florida), M.A. (University of Houston-Clear Lake), B.A. (St. Cloud State University), Associate Professor, 2012.

Slocum, Megan M., Ed.D. (Harding University), Lecturer, 2019.

Smith, Christy L., Ed.D., Ed.S., M.S.E., B.S.E. (University of Arkansas), Clinical Assistant Professor, 2019.

Smith, Tom E.C., Ed.D. (Texas Tech University), M.Ed., B.S.E. (University of Mississippi), University Professor, 2002.

Speight, Dana Renee, Ph.D. (University of Arkansas), Research Associate, 2019.

T

Terrell, Joyce E., Ph.D. (University of Arkansas), Instructor, 2019.

W

Watson, Angela R., Ph.D. (University of Arkansas), Lecturer, 2019.

Wissehr, Cathy, Ed.D. (University of Missouri-Columbia), M.N.S.Ed., B.S. (Southeast Missouri State University), Clinical Associate Professor, 2009.

Y

Yancy-Taylor, Pamela N., Ed.D. (Freed-Hardeman University), Instructor, 2019.

Young, Heather D., Ph.D. (University of Arkansas), M.S. (University of Tennessee), B.S. (Arkansas Tech University), Associate Professor, 2007.

Courses

CIED 5003. Elementary Education Seminar. 3 Hours.

This course is designed to synthesize the foundational content presented in the Master of Arts in Teaching core courses. It focuses on refinement of the generalized knowledge to accommodate specialized content children. Professional attitudes, knowledge and skills relevant to elementary students. Professional attitudes, knowledge and skills applicable to today's elementary educator are addressed. Prerequisite: Admission to the CHED M.A.T. (Typically offered: Spring)

CIED 5013. Measurement, Research and Statistical Concepts in the Schools. 3 Hours.

An introduction to constructing, analyzing, and interpreting tests; types of research and the research process; qualitative and quantitative techniques for assessment; and descriptive and inferential statistics. Prerequisite: Admission to graduate school. (Typically offered: Summer)

CIED 5022. Classroom Management Concepts. 2 Hours.

A number of different classroom management techniques are studied. It is assumed that a teacher must possess a wide range of knowledge and skills to be an effective classroom manager. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5032. Curriculum Design Concepts for Teachers. 2 Hours.

The design and adaptation of curriculum for students in regular and special K-6 classrooms. Theoretical bases and curriculum models are reviewed. Concurrent clinical experiences in each area of emphasis are included. Prerequisite: Admission to the M.A.T. program. (Typically offered: Spring)

CIED 5053. Multicultural Issues in Elementary Education. 3 Hours.

This course provides an introduction to the major concepts and issues related to multicultural education in elementary classrooms. The ways in which race, class, gender and exceptionality influence students' behavior are discussed. Prerequisite: Admission to graduate school. (Typically offered: Spring Odd Years; Summer)

CIED 5063. Disciplinary and Interdisciplinary Literacies in Education. 3 Hours.

This course teaches the integration of reading, writing, and new literacies within the discipline and across disciplines. Theory and strategy are presented as integrated strands of the language process as presented in the context of instructional principles and suggested teaching practices. A solid research base is emphasized while keeping the focus on practical application. Prerequisite: Admission to Teacher Education M.A.T. Program. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

CIED 5073. Action Research in Elementary Education. 3 Hours.

Provides the students with experience in conducting case studies and action research related to childhood education. In addition, students gain knowledge regarding practices used in ethnographic research. Prerequisite: Admission to M.A.T. program. (Typically offered: Spring)

CIED 508V. Elementary Education Cohort Teaching Internship. 1-6 Hour.

Full-time student teaching in grades K-6 to be repeated both fall and spring semesters. Students will practice and master instructional strategies under the supervision of qualified mentor teachers and university faculty members. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 5153. Creativity in Daily Practice. 3 Hours.

(Formerly CIED 4083.) Arts integration course including the ideas, design, and implementation of practices in the classroom, board room, and professional field that enrich the experiences of all stakeholders while building right-brain thinking skills for the new millennium. Graduate degree credit will not be given for both CIED 4083 and CIED 5153. (Typically offered: Spring Even Years) May be repeated for up to 6 hours of degree credit.

CIED 5162. Applied Practicum. 2 Hours.

Provides laboratory experiences for CIED 5173 (Literacy Assessment and Intervention). Corequisite: CIED 5173. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5173. Literacy Assessment and Intervention. 3 Hours.

Focuses on assessment of young children's literacy skills. Techniques discussed include informal observation, miscue analysis, and portfolio assessment. Prerequisite: Admission to graduate school. (Typically offered: Fall and Summer)

CIED 5203. English Language Arts/Speech & Drama Methods of Instruction. 3 Hours.

This course provides an introduction to teaching English language arts (ELA) and speech/drama in the context of elementary, middle and high school settings. The topics, issues, methods, and materials encompassing philosophical, cognitive, and psychological dimensions of teaching the content area provide the major tenets of instruction. (Typically offered: Summer)

CIED 5213. Issues and Trends in Literacy. 3 Hours.

This course provides an examination of practices to teaching literacy, broadly defined. The topics, issues, methods, and materials encompassing philosophical, cognitive, and psychological dimensions of teaching provide the major tenets of instruction. Prerequisite: Admission to M.A.T. (EDUCMA) Secondary program or instructor consent. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

CIED 5223. Learning Theory. 3 Hours.

This course provides the student with information about foundational issues in education, including history and philosophy of American Education, psychological and social theories of education, characteristics of learners, and learning processes. Prerequisite: Admission to M.A.T. degree program. (Typically offered: Summer)

CIED 5232. Interdisciplinary Studies. 2 Hours.

Introduction to the nature of interdisciplinary study: curricular content, course planning (topics and themes), instructional strategies, and evaluation and assessment. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall, Spring and Summer)

CIED 5243. The Moral Mind in Action. 3 Hours.

(Formerly CIED 4433.) The Moral Mind in Action explores how people reason through moral dilemmas and prepares students to more effectively recognize and resolve moral problems. Best practices of teachers and administrators of K-16 character education programs are discussed. Graduate degree credit will not be given for both CIED 4433 and CIED 5243. (Typically offered: Fall)

CIED 5253. Moral Courage. 3 Hours.

(Formerly CIED 4443.) Moral Courage explores the factors that support translating moral thinking into moral action. This course draws from the field of positive psychology to guide students as they leverage existing strengths and develop new strategies for acting with moral courage in their personal and professional lives. Best practices of teachers and administrators of K-16 character education programs are discussed. Graduate degree credit will not be given for both CIED 4443 and CIED 5253. (Typically offered: Spring)

CIED 5263. Assessment, Evaluation, and Practitioner Research. 3 Hours.

A study of assessment, testing, and evaluative procedures in classrooms including types of tests, abuses of tests, test construction, scoring, analysis and interpretation, statistical methods, and alternative evaluation and assessment techniques. Classroom-based data collection and analysis. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5273. Research in Curriculum and Instruction. 3 Hours.

An introduction to inquiry and research in curriculum and instruction. It examines the principles, strategies, and techniques of research, especially qualitative inquiry. Qualitative method in assessment and evaluation are considered. Practicum in educational research and evaluation is done as part of the class. (Typically offered: Fall)

CIED 528V. Teaching Experience. 1-6 Hour.

The teaching experience is an essential component of the Masters of Arts in Teaching degree. The two semester experience allows Teacher Candidates (TC) to make further application of theoretical principles of teaching and learning. Teacher Candidates will be assigned placement in area schools for both fall and spring semesters. The fall semester consists of a field experience including observation, co-planning, and co-teaching. The spring semester consists of an immersion experience for teacher candidates to plan and teach independently. Prerequisite: Admission to the M. A. T. Program (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 5313. Principles of Qualitative Research in Curriculum & Instruction. 3 Hours.

Designed specifically for aspiring qualitative researchers who wish to conduct research in settings unique to curriculum and instruction. Methods of research design, data analysis, and writing for publication will be emphasized. Strongly recommended for graduate students who are considering a qualitative thesis or dissertation in curriculum and instruction. (Typically offered: Spring Odd Years)

CIED 5333. Curriculum Theory and Development for Educators. 3 Hours.

The design and adaptation of curriculum for students in regular and special K-12 classrooms. Theoretical bases and curriculum models are reviewed. Concurrent clinical experiences in each area of emphasis are included. Prerequisite: Admission to the M.A.T. program. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

CIED 5363. Teaching in K-12 Online and Blended Classrooms. 3 Hours.

The study of curriculum, instructional methods and assessment techniques to facilitate student learning in K-12 virtual and blended teaching environments. Students enrolled in the course will be required to demonstrate knowledge of prevalent and relevant models of K-12 curriculum, web-based instructional methods, assessment techniques and utilize tools for the development and implementation of effective instruction in the K-12 virtual classroom. Prerequisite: Graduate standing. (Typically offered: Fall)

CIED 5393. Introduction to Linguistics. 3 Hours.

This course is an introduction to human language. The goal is to understand what it means to speak a language, including an introduction to phonetics and phonology (specifically the sound system of American English), morphology (the rules of English at the word level), syntax (rules that govern sentence level language), semantics (meanings of words) and sociolinguistics (or the study of language use in its social context). (Typically offered: Fall)

CIED 5423. Curriculum and Instruction: Models and Implementation. 3 Hours.

The study of models of curriculum and instruction and their implementation to facilitate student learning in a variety of instructional environments. (Typically offered: Spring)

CIED 5443. Methods of Teaching Foreign Language K-12. 3 Hours.

Study of the methods and materials in the teaching of foreign language in K-12 settings as well as the theories of second language acquisition. Includes philosophical, cognitive, and psychological dimensions of teaching foreign languages. The planning of instruction, microteaching, and the development of instructional materials are included. Prerequisite: Admission to the MAT program. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

CIED 5453. Evaluation Techniques. 3 Hours.

Evaluation of learning using traditional means of assessment as well as alternative or authentic assessment techniques. (Typically offered: Irregular)

CIED 5461. Capstone Research Seminar. 1 Hour.

This course provides students with basic knowledge and practical skills in understanding, utilizing and implementing a research design project with a focus in the discipline of curriculum and instruction with particular emphasis of some aspect of teaching and/or learning. As a part of this course students will design, conduct and report the results of an action research study undertaken in the teaching internship. Prerequisite: Admission to M.A.T. program. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

CIED 5513. Sound System of American English. 3 Hours.

This course will study the structure and development of American English (AE). Topics include: 1) the structure/systems of American English pronunciation, 2) vowels, 3) consonant system (including such features as minimal pairs, 4) prosody, intonation, rhythm, and stress, and 5) regionalism and social varieties, and 6) pedagogical approaches to teaching the features of American English. (Typically offered: Fall)

CIED 5523. Instructional Practices in Teaching Foreign Language. 3 Hours.

A pedagogical studies course based on the theoretical and practical aspects of methods, techniques, and materials for effective teaching of foreign languages in K-12 schools. Prerequisite: Admission to M.A.T. Program. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

CIED 5543. Structures of American English. 3 Hours.

This course provides an introduction to the grammars of English, including (but not restricted to) traditional, structural, and transformational-generative (universal grammar). It includes approaches to the teaching of all types of grammars. (Typically offered: Spring and Summer)

CIED 5553. Social Justice and Multicultural Issues in Education. 3 Hours.

This seminar provides an introduction to the major concepts and issues related to multicultural education and social justice in education and the ways in which race, ethnicity, class, gender, and exceptionality influence students' behavior. The course also examines the intersection of teacher and student perceptions of identity, schooling, and learning and the effects on educational systems. Prerequisite: Admission to MAT. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

CIED 5563. Teaching Internship/Action Research. 3 Hours.

During this course, Master's candidates will be provided with classroom time to prepare to teach and then will be assigned to a classroom or classrooms. During this time the candidates will have an opportunity (under supervision) to observe, to teach and to participate in classroom activities. Additionally, candidates will research some area of their own pedagogy relevant to the experience. (Typically offered: Irregular)

CIED 5573. Foundations of Literacy. 3 Hours.

Teaching of reading to children; techniques, research, and modern practices. (Typically offered: Fall, Spring and Summer)

CIED 5593. Advanced Diagnosis and Intervention. 3 Hours.

Emphasizes the diagnosis and remediation of reading difficulties in the classroom setting. Students are expected to become familiar with cause of reading failure, diagnosis instruments and procedures, principles of report writing, and corrective instructional methods and materials. The course is open to graduate students with instructor's consent. Enrollment limited to 20. Prerequisite: CIED 5573. (Typically offered: Irregular)

CIED 5683. Adolescent Literature. 3 Hours.

Content course in adolescent literature including selection, reading, evaluation, and psychological basis of classic and contemporary works. (Typically offered: Fall, Spring and Summer)

CIED 5713. Integrating the Elementary Curriculum. 3 Hours.

This course focuses on meaningful integration of science, mathematics, literacy, social studies, art, and music in the elementary classroom. A strong foundation for integrating the elementary curriculum will be developed by providing students with theoretical frameworks, research, resources, and methods related to classroom practice. Strategies to coordinate the integration of these subject areas for the K-4 classroom will be modeled. (Typically offered: Summer)

CIED 5723. Nature and Needs of Persons with Mild Disabilities. 3 Hours.

Educational, psychological, and social characteristics of individuals who have mild disabilities with emphasis on educational methods and modifications. Prerequisite: CIED 3023. (Typically offered: Fall)

CIED 5803. Nature and Needs of the Gifted and Talented. 3 Hours.

Educational, psychological, and social characteristics of gifted and talented children. Prerequisite: Graduate standing. (Typically offered: Fall)

CIED 5813. Curriculum Development in Gifted and Talented. 3 Hours.

Examines the various models for developing curriculum and providing services for students identified for gifted programs. Prerequisite: CIED 5803. (Typically offered: Spring)

CIED 5823. Gifted and Talented (Structured) Practicum. 3 Hours.

Supervised field experience in gifted education programs, schools, institutions, and other facilities for gifted/talented children. Prerequisite: CIED 5813. (Typically offered: Summer)

CIED 5843. Representations of American Education in Film. 3 Hours.

This course provides an examination of students, teachers, administrators, schools, and schooling as they exist on the silver screen. Of particular interest is how film representations and misrepresentations potentially affect public perceptions of education. This course draws on educational theory and the field of cultural studies. (Typically offered: Irregular)

CIED 5853. Issues in Mathematics Education. 3 Hours.

Study of research in mathematics education and applications to classroom teaching and learning. Emphasis will be given past and current research in the areas of students' cognitive development in mathematics, mathematics curriculum development, and teaching practices and assessment. (Typically offered: Irregular)

CIED 5913. Parent/Family Engagement for Culturally & Linguistically Diverse Students. 3 Hours.

Students will investigate characteristics of family-community engagement systems and models serving culturally and linguistically diverse (CLD) students and families. Identify qualities of a welcoming, accepting environment for CLD families and implement some of these characteristics in their classroom and schools. Support communication and facilitate contributions by CLD families to the school and community including leadership roles. Demonstrate knowledge, skills, best practices and resources to enhance CLD family-community engagement by developing and implementing a service-learning project in their school or community. Prerequisite: Graduate standing. (Typically offered: Summer)

CIED 5923. Second Language Acquisition. 3 Hours.

This is one of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course gives an introduction to the basics in research and learning theories involved in the acquisition of second languages and cultures, particularly ESL. (Typically offered: Fall)

CIED 5933. Second Language Methodologies. 3 Hours.

This is one of a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course introduces the basics in approaches, methodologies, techniques, and strategies for teaching second languages, especially ESL. (Typically offered: Spring)

CIED 5943. Teaching People of Other Cultures. 3 Hours.

This is one in a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course focuses on cultural awareness, understanding cultural differences, and instruction methods for integrating second cultures, especially the culture of the United States, into the curriculum. (Typically offered: Fall)

CIED 5953. Second Language Assessment. 3 Hours.

This is one in a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course introduces basic methods for testing, assessing and evaluating second language, especially ESL, learners for placement purposes and academic performance. (Typically offered: Spring)

CIED 5973. Practicum in Secondary Education. 3 Hours.

Students will engage in action research in a school setting to advance their knowledge of teaching and learning venues including schools and informal learning environments. Prerequisite: Permission. (Typically offered: Fall and Spring)

CIED 5983. Practicum in Curriculum & Instruction. 3 Hours.

This course will provide degree candidates with advance knowledge of teaching in the elementary or secondary schools. This will be accomplished through a semester-long practicum during which an action research project will be designed, enacted, and reported. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CIED 599V. Special Topics. 1-18 Hour.

Special topics. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CIED 600V. Master's Thesis. 1-6 Hour.

This course is designed for students completing a thesis at the master's level in curriculum and instruction and related programs. It may be taken multiple times for 1-6 credits but no more than 6 credits will be counted toward the degree. Prerequisite: Graduate Standing (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CIED 6013. Curriculum Theory, Development, and Evaluation. 3 Hours.

Principles and concepts of curriculum and development, with an analysis of the factors basic to planning, the aims of the educational program, the organization of the curriculum, curriculum models, and elements desirable in the curriculum of schools including evaluation. (Typically offered: Fall Odd Years)

CIED 6023. Instructional Theory. 3 Hours.

Study of psychological, anthropological, sociological, and educational theories of instruction and learning. Emphasis is placed on synthesizing a broad range of existing and emerging perspectives in understanding individual, interactional and contextual phenomena of instruction and learning. (Typically offered: Spring Even Years)

CIED 6033. Content Specific Pedagogy. 3 Hours.

This course explores the relationship between the content of courses taught in schools and the pedagogical principles that the teaching of the content requires. Students will discuss and synthesize findings from the research literature and from personal investigation. (Typically offered: Irregular)

CIED 6043. Analysis of Teacher Education. 3 Hours.

This course examines issues, problems, trends, and research associated with teacher education programs in early childhood, elementary, special education, and secondary education. Prerequisite: CIED 6023. (Typically offered: Summer Even Years)

CIED 6053. Curriculum and Instruction: Learner Assessment and Program Evaluation. 3 Hours.

This course provides an overview of designing, implementing and analyzing learner assessments as well as systemic and program evaluations in a variety of instructional environments. (Typically offered: Spring Even Years)

CIED 6073. Seminar in Developing Creativity. 3 Hours.

A study of the facets of creativity, how they can be applied to be used in one's everyday life, how they can be applied in all classrooms, and how to encourage the development of these in students. (Typically offered: Irregular)

CIED 6083. Piaget's Theory and Instruction. 3 Hours.

Piaget's theory has been applied to classroom instruction in various settings. This course will investigate the theory in depth, study classroom application, and students will devise application. Prerequisite: CIED 6023. (Typically offered: Spring Odd Years)

CIED 6093. Vygotsky in the Classroom. 3 Hours.

This course introduces the cultural-historical theory of L. Vygotsky and considers its complexity. The comprehensive nature of Vygotsky's heritage and the importance of the sociocultural context for understanding his work is emphasized, as well as the implications of his theories for contemporary educational settings. (Typically offered: Fall Even Years)

CIED 6123. New Literacy Studies. 3 Hours.

In the past decade scholars have expressed an interest in the diverse literacy practices in which adolescents engage outside of school. In using new media, adolescents interweave multiple sign system, including word and image, to construct a narrative or communicate information. How do readers interpret these texts? What conventions do authors manipulate to influence the meanings they construct? This course aims to answer these and other questions. (Typically offered: Fall Odd Years) May be repeated for up to 12 hours of degree credit.

CIED 6133. Trends and Issues in Curriculum and Instruction. 3 Hours.

Analysis of trends and issues in curriculum and instruction with emphasis on political/social contexts and prevailing philosophies/theories/practices across disciplines. Prerequisite: Admittance in Ed.D, Ed.S. or Ph.D. program. (Typically offered: Fall Even Years)

CIED 6143. Differentiated Instruction for Academically Diverse Learners. 3 Hours.

Major focus of this course will be the examination of differentiated instruction, a teaching philosophy appropriate for a wide range of learners. (Typically offered: Summer Even Years)

CIED 6153. Theories of Literacy Learning. 3 Hours.

In this seminar, students consider theories of literacy learning and their implications for practice and research. Theories are viewed as historically and socially situated, and students reflect on how their own work might be situated within these theories. The ways in which theories support research methodology are also explored. (Typically offered: Spring Odd Years)

CIED 6163. Social and Emotional Components of Gifted and Talented Students. 3 Hours.

Purpose of this course is to study the theoretical and practical aspects of those affective issues, behaviors, and experiences often associated with gifted and talented students. (Typically offered: Summer Even Years)

CIED 6173. Reviews of Research in Reading Comprehension. 3 Hours.

In this online course, students will learn types of reviews of research, including qualitative systematic reviews and meta-analyses, and will conduct a review of research on a topic related to reading comprehension. Students will consider implicit and explicit definitions of comprehension and the influence various definitions have on assessment, instruction, policy and research and will examine comprehension in different contexts, disciplines, genres, and platforms. The course is a CIED Area of Study or Cognate Course (not part of the Inquiry Core). (Typically offered: Summer Even Years)

CIED 6183. Theory and Research in Arts Integration. 3 Hours.

Content course in arts integration including the pedagogy, design, and implementation of lesson plans which simultaneously address core curriculum learning targets and teach skills through the visual and performing arts in order to address the needs of the learners of the new millennium. Prerequisite: Instructor consent. (Typically offered: Spring and Summer)

CIED 6193. Teaching English Language Learners in the Content Areas. 3 Hours.

This course prepares teachers to teach English language learners in math, science, and social studies. These subject areas each have their own vocabulary that must be mastered by English language learners. The course focuses on teachers of both children and adults. (Typically offered: Spring)

CIED 6243. Bakhtin in Language, Literacy, and Research. 3 Hours.

This seminar course explores a growing body of theory, research, and applications inspired by the ideas of Russian scholar Mikhail M. Bakhtin, who provides a unique perspective on language, literacy, and culture. Bakhtin's focus on the process of meaning-making through dialogic interaction is relevant for educators in all academic areas. Bakhtin's ideas provide a powerful humanistic alternative to prevailing formalistic tendencies in studying language, culture, and education. Many modern orientations, such as discourse analysis and dialogic pedagogy, can be traced to Bakhtinian concepts. In addition to exploring Bakhtinian concepts in language and literacy, this course applies a Bakhtinian framework for research. (Typically offered: Fall Odd Years)

CIED 6313. Issues, History, and Rationale of Science Education. 3 Hours.

This course is the foundation experience for those interested in the discipline of science education. It provides an overview of the fundamental issues in and vocabulary of science education. The course includes the research basis for science teaching, the literature of science education, and the issues and controversies surrounding the teaching of science. (Typically offered: Irregular)

CIED 6333. Nature of Science: Philosophy of Science for Science Educators. 3 Hours.

The Nature of Science is a hybrid arena consisting of aspects of the philosophy, history and sociology of science along with elements of the psychology of scientific observations all targeting the complete understanding of how science actually functions. Prerequisite: Admission to grad school. (Typically offered: Irregular)

CIED 6343. Advanced Science Teaching Methods. 3 Hours.

This course is designed for those educators who have had some previous instruction in science teaching methods and/or had some prior science teaching experience. Students will gain new or renewed perspectives with respect to their personal teaching ability while engaging in discussions and activities designed to assist others in professional grow in science instruction. Prerequisite: Admission to graduate school. (Typically offered: Irregular)

CIED 6443. Mixed Methods Research. 3 Hours.

This course will provide opportunities for students to acquire the skills, knowledge, and strategies necessary to design and implement a mixed methods research study. Emphasis is upon developing research questions, developing a research design, selecting a sample, and utilizing appropriate techniques for analyzing data. (Typically offered: Fall)

CIED 6533. Problem-Based Learning and Teaching. 3 Hours.

A course in the design, development, and delivery of the problem-based learning (PBL) model. Theoretical cases and curriculum models will be centered on issues and models related to PBL. (Typically offered: Irregular)

CIED 6603. Multicultural Education. 3 Hours.

This course is designed to trace, examine, discuss, and promote understanding of issues related to multicultural education, different views of multicultural education, and the impact of multicultural education upon the schooling process. Emphasis is upon schooling experiences of culturally diverse students, language issues, gender issues, and evaluation issues. Prerequisite: Admission to the Ed.S. or Ph.D. program. (Typically offered: Spring)

CIED 6623. Research Methods and Scholarship in Curriculum and Instruction. 3 Hours.

In this course students will look at methods and practices in writing a successful dissertation proposal. Emphasis will be placed on research studies, collection of reliable and valid data, and analysis of data. Throughout the course, topics will focus on what scholarship looks like in curriculum and instruction. Prerequisite: Advanced standing in the doctoral program. (Typically offered: Fall)

CIED 674V. PhD Research Internship. 1-6 Hour.

This research internship is for doctoral level students in curriculum and instruction. The goal is provide research experience within the doctoral course of study. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 680V. Ed.S. Project. 1-6 Hour.

Instructor permission required to register. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

CIED 684V. PhD Teaching Internship. 1-6 Hour.

This teaching internship is for doctoral level students in curriculum and instruction. The goal is to provide teaching experience within the doctoral course of study. (Typically offered: Fall, Spring and Summer)

CIED 694V. Special Topics. 1-6 Hour.

Discussion and advanced studies on selected topics in curriculum and instruction. Specific focus on recent developments. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CIED 695V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer)

CIED 699V. Doctoral Seminar. 1-3 Hour.

Doctoral seminar. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

CIED 700V. Dissertation. 1-18 Hour.

Dissertation. Prerequisite: Candidacy (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Design Studies (DSGN)

Jennifer Webb
Graduate Coordinator
120 Vol Walker Hall
479-575-4945
FayGrad@uark.edu

Degree Offered:

M.Des. in Design Studies

The Fay Jones School of Architecture and Design offers a Master of Design Studies (M.Des.). The goal is to provide a nationally-recognized, interdisciplinary design program that meets the needs of Arkansas, the region, and nation. The Master of Design Studies degree is recognized as multidisciplinary degrees that explores emerging concerns that are universal to the human-environmental design disciplines.

The program offers three areas of concentration:

Integrated Wood Design: This post-professional graduate degree provides advanced study investigating the design potential of wood products, fabrication methods, and constructed environments. The one-year, three-semester program is grounded in design's contribution to economic success. The studio-centered program provides immersive experiences, integrating distinctive course offerings across disciplinary boundaries while prompting students to engage complex, problem-solving scenarios. Utilizing strengths across the University of Arkansas campus, this program combines course offerings with a professional residency to immerse students in these dynamic fields.

Resiliency Design: This post-professional graduate degree is focused on community and landscape resiliency determined by critical factors including water, mobility, food, housing, aging, and public health. The one-year, three-semester program provides advanced study of pressing public-interest civic issues by combining design, research, and expanded modes of professional engagement. The University of Arkansas Community Design Center is one of the few university-based teaching offices in design programs nationally. This unique program will prepare graduates to engage interdisciplinary urban design challenges through service learning and public outreach in collaboration with a professional staff. Utilizing strengths across the University of Arkansas campus, this program combines course offerings with a professional residency to immerse students in these dynamic fields.

Retail and Hospitality Design: This post-professional graduate degree provides advanced study of strategic thinking and design methods relative to the hospitality and retail environments. The one-year, three-semester program is grounded in design's contribution to economic success. Business strategies are integrated with innovative problem solving to

craft unique experiences within these specialized settings. Proximity to international business enterprises and strategic relationships with global design firms enables graduates to integrate environmental, cultural, and social discourse to deliver comprehensive approaches to complex design scenarios. Utilizing strengths across the University of Arkansas campus, this program combines course offerings with a professional residency to immerse students in these dynamic fields.

Requirements for M.Des. with Integrated Wood Design Concentration

Requirements for the Master of Design: The program can be completed in 1 year (3 semesters including 2 full-time, on-campus semesters combined with an off-campus, summer residency component).

The curriculum includes two advanced design studios addressing increasingly complex challenges resolved first through the synthesis of multiple knowledge domains and moving to scenarios for which there are unidentified constraints and unknown methods for solution.

The M.Des. program requires 36 credit hours. Core courses comprise 24 credit hours and each concentration requires an additional 12 credit hours of elective coursework.

Core Courses

FJAD 6723	Methods of Design Inquiry	3
FJAD 6803	Design Leadership	3
FJAD 6906	Advanced Design Studio	6
FJAD 6916	Advanced Design Studio II	6
FJAD 6926	Graduate Residency	6
Total Hours		24

Additional requirements for the concentration in Integrated Wood Design:

Choose 6 hours from:		6
SUST 5103	Analysis and Design of Resilient Systems	
SUST 5203	Decision Making, Analysis and Synthesis in Sustainability	
CVEG 4353	Timber Design	
Dependent upon previous coursework and experience, the remaining 6 hours of graduate-level, elective courses may be selected from CVEG, MEEG, INEG, ENDY and courses from the School of Forestry and Natural Resources at the University of Arkansas at Monticello. These elective courses require approval from the Graduate Advisor.		6
Total Hours		36

Requirements for M.Des. with Resiliency Design Concentration

Requirements for the Master of Design: The program can be completed in 1 year (3 semesters including 2 full-time, on-campus semesters combined with an off-campus, summer residency component).

The curriculum includes two advanced design studios addressing increasingly complex challenges resolved first through the synthesis of multiple knowledge domains and moving to scenarios for which there are unidentified constraints and unknown methods for solution.

The M.Des. program requires 36 credit hours. Core courses comprise 24 credit hours and each concentration requires an additional 12 credit hours of elective coursework.

Core Courses

FJAD 6723	Methods of Design Inquiry	3
FJAD 6803	Design Leadership	3
FJAD 6906	Advanced Design Studio	6
FJAD 6916	Advanced Design Studio II	6
FJAD 6926	Graduate Residency	6
Total Hours		24

Additional requirements for the concentration in Resiliency Design:

Choose 12 hours from the following:		12
SUST 5103	Analysis and Design of Resilient Systems	
SUST 5203	Decision Making, Analysis and Synthesis in Sustainability	
FJAD 6813	Cities and Public Good	
FJAD 6823	Vocabularies of Context Production	
Dependent upon previous coursework and experience, graduate level courses from Public Policy, Sociology, Public Administration, or Environmental Dynamics may be utilized with approval from the Graduate Adviser.		
Total Hours		36

Requirements for M.Des. with Retail and Hospitality Design Concentration

Requirements for the Master of Design: The program can be completed in 1 year (3 semesters including 2 full-time, on-campus semesters combined with an off-campus, summer residency component).

The curriculum includes two advanced design studios addressing increasingly complex challenges resolved first through the synthesis of multiple knowledge domains and moving to scenarios for which there are unidentified constraints and unknown methods for solution.

The M.Des. program requires 36 credit hours. Core courses comprise 24 credit hours and each concentration requires an additional 12 credit hours of elective coursework.

Core Courses

FJAD 6723	Methods of Design Inquiry	3
FJAD 6803	Design Leadership	3
FJAD 6906	Advanced Design Studio	6
FJAD 6916	Advanced Design Studio II	6
FJAD 6926	Graduate Residency	6
Total Hours		24

Additional requirements for the concentration in Retail and Hospitality Design:

Choose 12 hours from the following:		12
HOSP 4663	Hospitality Management Capstone	
HOSP 5643	Meetings and Convention Management	
HOSP 5653	Global Travel and Tourism Management	
ISYS 5363	Business Analytics	
MKTG 5103	Introduction to Marketing	
MKTG 5563	Retail Strategy	
MKTG 5553	New Product Development and Strategy	
MKTG 5433	Consumer and Market Research	

SCMT 5633 Introduction to Supply Chain Management

Total Hours 36

Dependent upon the area of interest and previous coursework and experience, graduate level courses from Architecture, Landscape Architecture, Interior Design, Art, or other departments may be utilized with approval from the Graduate Advisor.

Courses

FJAD 6023. Design Seminar. 3 Hours.

Advanced seminars of special interest to students and faculty that are not covered in other courses. Prerequisite: Admission to the Master of Design Program (DSGNMDS). (Typically offered: Irregular) May be repeated for degree credit.

FJAD 6723. Methods of Design Inquiry. 3 Hours.

Investigation into the practical, theoretical, and methodological strategies necessary for embarking upon inquiry and discourse for design-related problems. Pre- or Corequisite: Admission into the Master of Design program. (Typically offered: Fall)

FJAD 6803. Design Leadership. 3 Hours.

Explores leadership through conceptual and theoretical perspectives. Emphasis is on developing and managing effective design processes, methods, and organizations enabling innovative design practices. Students will explore contemporary issues and forces that affect the conditions of how design is embedded in thought leadership. Pre- or Corequisite: Admission into the Master of Design program. (Typically offered: Spring)

FJAD 6813. Cities and Public Good. 3 Hours.

Studies infrastructure as socio-technical systems and potential transitions to lower-carbon futures. Concepts governing Large Technical Systems such as obduracy, path-dependency, energy transitions, value capture, and public good are explored through analytic frameworks like Multi-level Perspectives (MLP) and Socio-technical Systems Theory (STS) in the context of incumbent technologies. Pre- or Corequisite: Admission into the Master of Design program. (Typically offered: Fall and Spring)

FJAD 6823. Vocabularies of Context Production. 3 Hours.

Explores connectivity through spatial and organizational formats from urbanism to supply chains, ecosystems, resource sheds, infrastructure, neighborhoods, eco-districts, and other public spaces. In addition to the traditional categories of geometry, proportion, and fit used to define place, vocabularies of flow, timing, interactivity, phasing, modulation, distribution, and emergence will be examined. Pre- or Corequisite: Admission into the Master of Design program. (Typically offered: Fall and Spring)

FJAD 6833. Wood Theories, Tectonics and Environmental Response. 3 Hours.

Investigate wood design through theoretical, technical and practical inquiry emphasizing tectonics responding to a range of material and environmental aspects. Focused study of wood's physical properties, functions, and behavior in manufactured and constructed assemblies. Current and future global issues, industry, economy, and the design of the constructed environment are explored. Prerequisite: Admission to the Master of Design Studies Degree. (Typically offered: Fall)

FJAD 6843. Advanced Wood Production Processes. 3 Hours.

Examine performative wood design at the intersection of cutting edge of fabrication-production technologies and the material assembly at multiple scales to expand the limits of current practice. Opportunities for wood design are re-examined in light of evolving digital technologies, practices and theories of making. Prerequisite: Admission to the Master of Design Studies Program. (Typically offered: Spring)

FJAD 6906. Advanced Design Studio. 6 Hours.

A topical design studio investigating project development dependent upon the synthesis of knowledge and application of critical thinking to complex environmental design problems. The intimate relationship between architecture, place and culture is used to create connection and relevance in the built environment. Pre- or Corequisite: Admission into the Master of Design program. (Typically offered: Fall)

FJAD 6916. Advanced Design Studio II. 6 Hours.

An advanced topical design studio utilizing methods from domains external to design disciplines. Project resolution requiring skill in generating design ideas developed through strategic planning and responding to sociopolitical, economic, and environmental drivers. Pre- or Corequisite: Admission into the Master of Design program. Prerequisite: Completion of FJAD 6906. (Typically offered: Spring)

FJAD 6926. Graduate Residency. 6 Hours.

Experiential learning integrating knowledge and theory in professional environment. This guided experience will facilitate career development, professional relationships, and provide a critical opportunity to apply new skills and knowledge to real problems. Pre- or Corequisite: Admission into the Master of Design program. Prerequisite: Completion of FJAD 6906 and FJAD 6916. (Typically offered: Summer)

Education Policy (EDPO)

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Department of Education Reform Website (<http://edre.uark.edu/>)

Degrees Conferred:

Ph.D. in Education Policy (EDPO)

Program Description: The Ph.D. in Education Policy is designed to prepare policy-oriented scholars for careers in academia, think tanks, and public service in the field of K-12 education policy. The program of study is based on the social sciences and other academic disciplines, supported by empirical research. The program has five components:

- Core courses to establish the disciplinary base and intellectual framework;
- Research methods to prepare for empirical work;
- Field seminars in the key education reform fields, to understand and contribute to research behind key policy debates;
- Electives to pursue further specialization; and
- Dissertation, following completion of comprehensive exams.

Ph.D. in Education Policy

Admission to the Program: In addition to meeting university requirements for admission to the Graduate School, applicants should have combined GRE scores of 304, writing score of 4.0, and minimum

GPA of 3.0 undergraduate or 3.5 in a masters' program. Admission is based on the individual's total profile, with special attention given to those with professional experience in education policy. Those students who have completed calculus and statistics courses prior to arriving on campus will more readily satisfy the prerequisites for the program's research methods sequence.

Program of Study

Core Courses

EDRE 5053	Philosophy and History of Education and Education Reform	3
EDRE 6023	Economics of Education	3
EDRE 6033	Politics of Education	3
EDRE 6043	Finance and Education Policy	3
EDRE 6053	Measurement of Educational Outcomes	3

Research Methods

EDRE 6103	Quantitative Analytical Techniques for Education Policy	3
EDRE 6213	Program Evaluation and Research Design	3
EDRE 6223	Research Seminar in Education Policy	3
ECON 6623	Econometrics II	3

Education Reform Fields

EDRE 6413	Issues in Education Policy	3
EDRE 6423	Seminar in School Choice Policy	3
EDRE 6433	Seminar in Education Accountability Policy	3
EDRE 6443	Seminar in Education Leadership Policy	3
EDRE 6453	Seminar in Teacher Quality and Public Policy	3

Electives

Students will take four electives, which typically will be a combination of relevant course offerings in other departments and directed research projects. The specific electives will all be subject to approval of the Education Policy graduate director, and may include subjects such as education law, qualitative methods, advanced quantitative methods, organizational theory, etc. Directed research projects could be either of the student's own design or within the context of one of the various research projects underway in the Department of Education Reform.

Dissertation

EDRE 700V	Doctoral Dissertation	18
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Total Hours		72
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Students will take a written qualifying examination after the spring term of the first year, covering research methods, with applications to the first-year content courses. The field exams, with both written and oral components, will ordinarily be taken in the fall or spring of the third year, covering the student's choice of two fields.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Costrell, Robert M., Ph.D. (Harvard University), B.A. (University of Michigan), Professor, Department of Education Reform, 2006.

Greene, Jay Phillip, Ph.D., A.M. (Harvard University), B.A. (Tufts University), Distinguished Professor, Department of Education Reform, 2005.

Wolf, Patrick J., Ph.D., M.A. (Harvard University), B.A. (University of Saint Thomas), Distinguished Professor, Department of Education Reform, 2006.

Zamarro Rodriguez, Gema, Ph.D., M.S. (Centro de Estudios Monetarios y Financieros, Spain), B.A. (Universidad Carlos III de Madrid, Spain), Professor, Department of Education Reform, 2014.

Courses

EDRE 5053. Philosophy and History of Education and Education Reform. 3 Hours.

This course traces the historical development of the philosophical debates concerning education and its role in society as well as how those ideas and consequent demands for reform affected the educational system and its structures. (Typically offered: Spring Even Years)

EDRE 5113. Education Policy in Israel. 3 Hours.

This course, which is built around a study abroad component in Israel, examines education policy in Israel. It will compare US and Israeli perspectives and ideas on education reform and education innovation in diverse societies. (Typically offered: Summer Even Years)

EDRE 6023. Economics of Education. 3 Hours.

This course applies the principles of economic analysis to education and education reform. Topics include: Human capital and signaling theories; education labor markets; educational production functions; public policy and market forces. The course also features empirical evidence evaluating economic theories of education. (Typically offered: Spring Odd Years)

EDRE 6033. Politics of Education. 3 Hours.

This course explores historical and institutional forces that help shape education policymaking. Particular attention will be paid to the experience of past education reform movements as well as the influence of interest groups, federalism, bureaucracy, governance structures, public opinion, and judicial review on education policy. (Typically offered: Fall)

EDRE 6043. Finance and Education Policy. 3 Hours.

This course examines K-12 education finance from the standpoint of education reform policy. The tools of analysis include economics, public finance, law and political science. Topics include: revenue sources and fiscal federalism, standards-based reform and school finance, school funding formulas, adequacy lawsuits, the politics of school funding, school funding and markets. The course also features empirical evidence on the educational impact of education finance. (Typically offered: Spring Even Years)

EDRE 6053. Measurement of Educational Outcomes. 3 Hours.

This course will train students to consider the various types of outcome and assessment measures used for education at the K-12 level throughout the United States; further, the students will engage in analyses of research that relies on these various outcome measures. (Typically offered: Fall)

EDRE 6103. Quantitative Analytical Techniques for Education Policy. 3 Hours.

This course introduces students to the quantitative techniques required for the evaluation of education policies and interventions. The class will focus on the identification and estimation of causal effects, necessary assumptions, and how to deal with the failure of these assumptions. Major topics covered include randomized experiments, the ordinary least squares regression method, matching estimators, instrumental variable methods, regression discontinuity, difference in difference methods, and introduction to estimation strategies with panel data models. (Typically offered: Fall)

EDRE 6123. Intermediate Quantitative Analytical Techniques for Education Policy. 3 Hours.

This course builds on the content presented in EDRE 6103 by delving more deeply into benefits and limitations of the Ordinary Least Squares (OLS) estimator while also introducing the student to new estimation techniques. Students will be introduced to panel data estimation techniques, methods for robust inferences, and use of the Maximum Likelihood estimator for estimating binary and multinomial choice models. Students will also expand on their knowledge of how to implement STATA in practical research settings. Prerequisite: EDRE 6103. (Typically offered: Spring)

EDRE 6143. Advanced Quantitative Analytical Techniques for Education Policy. 3 Hours.

This course introduces students to advanced estimation methods and empirical models often used in education policy empirical research, such as Maximum Likelihood to estimate discrete choice models, censored models and selection models, duration models, Generalized Method of Moments to estimate dynamic panel data models, and bootstrapping of standard errors and simulation-based inference. Prerequisite: EDRE 6103. (Typically offered: Spring)

EDRE 6213. Program Evaluation and Research Design. 3 Hours.

This course provides students with training in the methods used to generate evidence-based answers to questions regarding the efficacy and impacts of education programs. The central questions that motivate most educational program evaluations are: (1) What is the problem? (2) What policies or programs are in place to address the problem? (3) What is their effect? (4) What works better? (5) What are the relative benefits and costs of alternatives? (Typically offered: Fall)

This course is cross-listed with ESRM 6613.

EDRE 6223. Research Seminar in Education Policy. 3 Hours.

This course provides students with the opportunity to learn about education policy research by interacting directly with the leading scholars and practitioners in the field. Students will also gain a foundation in the field of education policy research by reading and discussing some of the founding works of the field. (Typically offered: Fall)

EDRE 636V. Special Problems. 1-6 Hour.

Independent reading and investigation in education policy under faculty supervision. Prerequisite: Approval of EDRE Graduate Director. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

EDRE 6413. Issues in Education Policy. 3 Hours.

This course examines how K-12 education policy is designed and implemented in the United States. Students will develop a working knowledge of policymaking frameworks to examine major education policies of current interest and debate key policy issues that arise at each level of government. In great measure, the goals of the course will be accomplished through the consideration of opposing stances on key educational policy debates and issues that are of current import. (Typically offered: Spring)

This course is cross-listed with EDFD 5683.

EDRE 6423. Seminar in School Choice Policy. 3 Hours.

This course examines parental school choice - perhaps the most controversial education reform of our age. Students will be introduced to the full set of school choice policies, including charter schools and vouchers, and evaluate their benefits and drawbacks as educational interventions. (Typically offered: Fall Even Years)

EDRE 6433. Seminar in Education Accountability Policy. 3 Hours.

This course examines K-12 school and district accountability under state and Federal law (e.g. NCLB), as well as teacher and student accountability (e.g. exit exams). Topics include the theory of incentives and politics of tradeoffs, measurement issues of policy implementation, and statistical evidence on policy effects on performance. (Typically offered: Spring Odd Years)

EDRE 6443. Seminar in Education Leadership Policy. 3 Hours.

This course will examine the individual and systemic prerequisites of effective leadership of schools and school systems, and effective leadership techniques. It will consider the differences between public and private sector leadership. It will also explore ways to identify effective and ineffective leaders, and design and evaluate systems to recruit and train the former and reassign the latter. (Typically offered: Fall Odd Years)

EDRE 6453. Seminar in Teacher Quality and Public Policy. 3 Hours.

Examines how our public system of education shapes the preparation and continued professional development of K-12 teachers, and how that system has been influenced by standards-based education reform as well as efforts to enhance the quality of teaching and learning in public schools. Uses education reform legislation in several states as case studies to illustrate the successes and pitfalls of attempts to reform teacher education and licensure through public policy. (Typically offered: Spring Even Years)

EDRE 6463. Psychology of Education. 3 Hours.

This course explores psychological science findings that pertain to education research and policy with a focus on empirical evidence. Particular emphasis will be on studying individual differences in the context of education. Historical, methodological, and measurement perspectives will be introduced and psychological constructs studied and applied in educational contexts will be examined. (Typically offered: Spring Odd Years)

EDRE 674V. Internship in Education Policy. 1-6 Hour.

Internship at a public or private entity involved in the making or implementation of education policy. Paper required on a significant aspect of the internship experience. Prerequisite: Approval of EDRE Graduate Director. (Typically offered: Irregular)

EDRE 699V. Special Topics. 1-3 Hour.

Topics vary depending on instructor. Prerequisite: Approval of EDRE Graduate Director. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

EDRE 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Irregular) May be repeated for degree credit.

Educational Equity (EDEQ)

Ed Bengtson

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Tom Smith

Program Coordinator

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Degree Offered:

M.Ed. in Educational Equity (EDEQME)

Program Description: The Master of Education in Educational Equity is a two-year, 33-hour graduate program targeting early career educators who are committed to increasing effectiveness in their classrooms and meeting the educational needs of students in high-poverty districts. Participants work full-time as lead teachers in high-need districts while enrolled in this program. The overall goal of the program is to increase the effectiveness and support of these early-career teachers while they lead classrooms in struggling, high-poverty schools in Arkansas. Degree candidates will bring a deep commitment to making a difference across the state of Arkansas, a desire to share in the ambitious work of teacher development, and an

unwavering belief that students in high-poverty schools need a consistent, high-quality teacher workforce.

Requirements for M.Ed. in Educational Equity

Admission Requirements: Applicants must meet all requirements for admission to the University of Arkansas Graduate School, except the standardized test score requirement. Additionally, the following are requirements for admission into the program:

- Two years of teaching experience or a bachelor's degree in education or a related field with one year teaching experience.
- Valid teaching license.
- Applicants must complete program-specific admission requirements including an interview with program staff and providing at least two references.

Degree Requirements: Degree candidates enter the Master of Education in Educational Equity program during the summer as a cohort. The degree is completed in two years (four regular semesters and two summers) and focuses on building skills around teaching particular content areas in high-poverty districts. During the program, candidates complete two courses each term through web-based distance technology, one in-person course during the first summer, and two courses (one in-person course and one course either in-person or online) during the second summer. Candidates are also working full-time as lead teachers in high-need districts across the state during the two year program, which provides them with a real-time opportunity, with mentor support, to implement instructional strategies. During their final semester, candidates will complete a written comprehensive examination.

Educational Equity core requirements

EDEQ 5003	Best Practices for Teaching in High-Needs Schools	3
EDEQ 5013	Classroom Management Mechanics and Content	3
EDEQ 5023	Collecting and Analyzing Student Data	3
EDEQ 5033	High-Leverage Teaching Practices in High-Poverty Schools	3
EDEQ 5043	Reflecting and Planning Content Delivery	3
EDEQ 5053	Understanding and Exploring Community Context	3
Electives		15
SPED 5173	Introduction to Dyslexia: Literacy Development & Structure of Language	
SPED 5733	Inclusive Practices for Diverse Populations	
EDFD 5683	Issues in Educational Policy	
EDFD 5373	Psychological Foundations of Teaching and Learning	
or EDLE 503	Psychology of Learning	
	Other adviser-approved courses that support the goals and objectives of the program	
Total Hours		33

Educational Equity plan of study follows the sequence of First Year Summer, First Year Fall, First Year Spring, Second Year Summer, Second Year Fall, and Second Year Spring.

First Year	Units		
	Fall	Spring	Summer
EDEQ 5013 Classroom Management Mechanics and Content	3		
Elective ¹	3		

EDEQ 5023 Collecting and Analyzing Student Data			3
Elective ¹			3
EDEQ 5003 Best Practices for Teaching in High-Needs Schools			3
Year Total:	6	6	3

Second Year	Units		
	Fall	Spring	Summer
EDEQ 5043 Reflecting and Planning Content Delivery	3		
Elective ¹	3		
EDEQ 5053 Understanding and Exploring Community Context		3	
Elective ¹		3	
EDEQ 5033 High-Leverage Teaching Practices in High-Poverty Schools			3
Elective ¹			3
Year Total:	6	6	6

Total Units in Sequence: 33

¹ 15 hours of electives required chosen from: SPED 5173, SPED 5733, EDFD 5683, EDFD 5373 or EDLE 5033, or other adviser-approved courses that support the goals and objectives of the program.

Courses

EDEQ 5003. Best Practices for Teaching in High-Needs Schools. 3 Hours.

This course is designed to equip students with the knowledge and skills to be successful in the classroom. The course primarily focuses on teaching specific content areas, classroom management, and understanding the socioeconomic circumstances driving poverty. Sessions will focus on Cultural Competency or Content and Pedagogy. Students will learn and develop a working knowledge of the concepts of rigor, cultural responsiveness, and learner variability. Prerequisite: Admission into EDEQ program or instructor consent. (Typically offered: Summer)

EDEQ 5013. Classroom Management Mechanics and Content. 3 Hours.

The course provides students the knowledge and skills to move from good to great in the areas of classroom mechanics and content. Directors of Content will provide direct classroom observation, feedback, and coaching. Students will periodically meet electronically as a whole cohort for additional sessions on vital skills such as workshopping lesson plans, analyzing data, diagnosing and planning for interventions, sharing best practices, and building community and parent engagement skills. Prerequisite: Admission into EDEQ program or instructor consent. (Typically offered: Irregular)

EDEQ 5023. Collecting and Analyzing Student Data. 3 Hours.

This course provides students the knowledge and skills to collect and analyze quantitative and qualitative data in order to master data-driven instruction and improvement. Data from norm-referenced, high stakes testing as well as informal assessments will be used. Prerequisite: Admission into EDEQ program or instructor consent. (Typically offered: Irregular)

EDEQ 5033. High-Leverage Teaching Practices in High-Poverty Schools. 3 Hours.

This course focuses on high-leverage teaching practices in high-poverty schools that research has demonstrated can impact student achievement and be used across different content areas and grade levels. High-leverage practices can provide infrastructure to support effective teaching and consistent learning for students to succeed. Students focus on a core set of evidence-based fundamental capabilities to advance their skills in equitable teaching. Prerequisite: Admission into EDEQ program or instructor consent. (Typically offered: Summer)

EDEQ 5043. Reflecting and Planning Content Delivery. 3 Hours.

This course focuses on the delivery of specific content instruction for students in high-needs school districts in content areas, e.g. math, science, literacy, special education. Students identify specific, evidence-based strategies for students from high poverty schools and apply these strategies directly in classrooms. This course also provides students the opportunity to build the skills necessary to engage in self-directed growth and learning related to their instruction. Prerequisite: Admission into EDEQ program or instructor consent. (Typically offered: Irregular)

EDEQ 5053. Understanding and Exploring Community Context. 3 Hours.

This course provides students the opportunity to understand the overall impact of poverty, and explore equity within their specific school and community context. The course is designed for students to build the skills necessary for tapping into existing networks and building relationships outside of their school building. Prerequisite: Admission into EDEQ program or instructor consent. (Typically offered: Irregular)

Educational Leadership (EDLE)

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Educational Leadership Website (<https://cied.uark.edu/programs/educational-leadership/>)

Degrees Conferred:

M.Ed. in Educational Leadership (EDLE)
Ed.S. in Educational Leadership (EDLE)
Ed.D. in Educational Leadership (EDLE)

Graduate Certificates Offered (non-degree):

Arkansas Curriculum/Program Administrator (p. 337) (ACPA)
Building-Level Administration (p. 113) (PSBL)
District-Level Administration (p. 113) (PSDL)

Program Description: The Educational Leadership graduate degrees and graduate certificate programs are designed to prepare qualified persons for a variety of leadership roles. Placement of recent graduates have been in the following areas: principalships and other school-site administrative and supervisory positions; superintendents and other central administrative personnel; and federal and state governmental positions in education.

Primary Areas of Faculty Research: School leadership; school/community relations; educational law; school finance; effective schools; rural schools; the use of data for school improvement; principal

succession and retention; the education doctorate as a professional doctorate; leadership ethics; and moral decision-making.

Admission to the M.Ed., Ed.S., and Ed.D. Programs: In addition to meeting university requirements for admission to the Graduate School, all candidates seeking admission to any educational leadership program must complete program application procedures, which are described on the program website (<http://edle.uark.edu>). Admissions for the Masters and Specialist degrees are rolling; therefore, prospective students can apply at any time of the year. Application for admission must be completed before the required deadlines for each semester as set by the Graduate School. The Ed.D. program follows a cohort model; therefore, a completed application deadline is set for Feb. 1 each year. Each cohort starts in the summer semester.

Admission to the Graduate Certificate programs: Applicants must meet university requirements for admission to the Graduate School as non-degree-seeking, but certificate-seeking students, and must have a master's degree. In addition, to receive the graduate certificate in district-level administration, applicants must have a valid teaching license and a valid building-level administration license.

M.Ed. in Educational Leadership

Admission to the M.Ed. Programs: In addition to meeting university requirements for admission to the Graduate School, all candidates seeking admission to any educational leadership program must complete program application procedures, which are described on the program website (<http://edle.uark.edu>). Admissions for the Master's degree are rolling; therefore, prospective students can apply at any time of the year. Application for admission must be completed before the required deadlines for each semester as set by the Graduate School.

Requirements for the Master of Education (M.Ed.) Degree (33 hours):

The master's degree in Educational Leadership is designed primarily to provide professional preparation for students seeking administrative positions in elementary and secondary schools. It requires the following:

Completion of the following required common courses in Educational Leadership (24 credits):

EDLE 5013	School Organization and Administration	3
EDLE 5023	The School Principalship	3
EDLE 5043	Leadership Ethics	3
EDLE 5053	School Law	3
EDLE 5063	Instructional Leadership, Planning, and Supervision	3
EDLE 5083	Analytical Decision-Making	3
EDLE 5093	Effective Leadership for School Improvement	3
EDLE 574V	Internship	1-6

Completion of nine credit hours from foundations courses, including:

EDLE 5033	Psychology of Learning	3
or EDFD 5373	Psychological Foundations of Teaching and Learning	
EDLE 5073	Research for Leaders	3
EDLE 5003	Schools and Society	3

A cumulative grade-point average of at least 3.00 on all course work is required for the degree. No grades below "C" will be accepted for graduate degree credit.

Satisfactory performance on a written comprehensive examination or portfolio presentation is required.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ed.S. in Educational Leadership

Admission Requirements: Candidates must have a master's degree in educational leadership plus submit either a GRE score or a School Leadership Licensure Assessment (SLLA) score for admission. All other requirements of admission to the graduate school and Educational Leadership program must also be met.

Requirements for the Educational Specialist Degree (30 hours post Masters): The specialist degree program in Educational Leadership is designed primarily to provide professional preparation for students involved in school-site administration and those individuals who have districtwide administrative responsibilities.

EDLE 6023	School Facilities Planning and Management	3
EDLE 6053	School-Community Relations	3
EDLE 6093	School District Governance: The Superintendency	3
EDLE 6103	School Finance	3
EDLE 6173	School Business Management	3
EDLE 674V	Internship	1-6
EDLE 6333	Advanced Legal Issues in Education	3
The following three research courses are to be taken in sequence:		
EDLE 6503	Topics in Educational Research for School Administration	3
or ESRM 6403 Educational Statistics and Data Processing		
EDLE 6513	Program Evaluation in Education	3

Note: Prior to District-Level Licensure application, all students must present a culminating project to a committee of faculty with practitioner representation for the district-level license.

Students should also be aware of Graduate School requirements with regard to specialist degrees (p. 456).

Ed.D. in Educational Leadership

Admission to the Ed.D. Program: In addition to meeting university requirements for admission to the Graduate School, all candidates seeking admission to any educational leadership program must complete program application procedures, which are described on the program website (<http://edle.uark.edu>). Admissions for the Master's and Specialist degrees are rolling; therefore, prospective students can apply at any time of the year. Application for admission must be completed before the required deadlines for each semester as set by the Graduate School.

The Ed.D. program follows a cohort model; therefore, a completed application deadline is set for February 1 each year. Each cohort starts in the summer semester.

Requirements for the Doctor of Education Degree: Completion of the courses required for the Master of Education degree in Educational Leadership, and completion of the courses required for the Educational Specialist degree in Educational Leadership.

EDLE 6533	Educational Policy	3
ESRM 6533	Qualitative Research	1-3

or HRWD 572V Workshop		
EDLE 699V	Seminar ¹	1-6

¹ Seminar, taken on campus three times for one credit each. Doctoral students will come to campus to meet with faculty and practitioners for a one-credit seminar that will serve as a valuable capstone for the distance experience. The meaningful campus experience will be an intensive long weekend cohort seminar on the University of Arkansas campus. Each cohort weekend will be focused on a theme that connects theory with practice and includes mini-lectures by scholars and practitioners in the field, facilitated discussion groups, and lively debate of critical issues facing school leaders. The intent of the cohort weekend is to build relationships, introduce students to leaders in the field and expose them to interactive, hands-on learning experiences that lend themselves more easily to the face-to-face environment.

Nine credit hours from either the qualitative track or the quantitative track:

Qualitative Track		
EDLE 6553	Advanced Qualitative Methods in Educational Research	3
or ESRM 6543 Advanced Qualitative Research		
Quantitative Track		
ESRM 6413	Experimental Design in Education	3
ESRM 6423	Multiple Regression Techniques for Education	3
ESRM 6623		
18 semester hours of dissertation credit		18

A minimum grade point average of at least 3.25 on all graduate course work, and on all course work presented for the Ed.D. degree.

Satisfactory completion of all requirements governing the written and oral examinations for the candidacy examination, the dissertation, and the final oral dissertation defense. The Ed.D. degree must be completed within seven years from the date the Declaration of Intent is signed.

The program of study must comply with university residency requirements.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Courses

EDLE 5003. Schools and Society. 3 Hours.

Schools and Society is an introduction to the social, structural, political and historical forces that have created the American school system. (Typically offered: Summer Even Years)

EDLE 5013. School Organization and Administration. 3 Hours.

Analysis of structure and organization of American public education; fundamental principles of school management and administration. (Typically offered: Fall; Summer Odd Years)

EDLE 5023. The School Principalship. 3 Hours.

Duties and responsibilities of the public school building administrator; examination and analysis of problems, issues, and current trends in the theory and practice of the principalship. (Typically offered: Spring and Summer)

EDLE 5033. Psychology of Learning. 3 Hours.

This course prepares educational leaders to create and sustain a learning centered environment in school settings. Students will study learning theory across the lifespan and apply it to the practice of instructional leadership, curriculum design, and staff development. (Typically offered: Spring; Summer Odd Years)

EDLE 5043. Leadership Ethics. 3 Hours.

Leadership Ethics is an experiential based course grounded in ethical decision making theory that uses case study and practice to study school based ethical dilemmas. (Typically offered: Fall; Summer Odd Years)

EDLE 5053. School Law. 3 Hours.

Legal aspects of public and private schooling: federal and state legislative statutes and judicial decisions, with emphasis upon Arkansas public education. (Typically offered: Fall; Summer Odd Years)

EDLE 5063. Instructional Leadership, Planning, and Supervision. 3 Hours.

Instructional Leadership, Planning, and Supervision is designed to prepare practitioners to seize the role of educational leader at the school site level through the development of a vision that will be used to drive a data driven instructional school plan. (Typically offered: Fall; Summer Odd Years)

EDLE 5073. Research for Leaders. 3 Hours.

This course introduces research methodology that will support school leaders as consumers of educational research and supervisors of action research within their schools. Practical application of research for school leaders is emphasized. (Typically offered: Spring; Summer Odd Years)

EDLE 5083. Analytical Decision-Making. 3 Hours.

Analytical Decision Making is a performance based examination of the principles and practices related to the building administrator's role in the development, administration, and evaluation of curricular programs in public schools. This includes creating a school culture, fostering communication, aligning curriculum with state mandated standards, and staff development. (Typically offered: Spring Even years; Summer)

EDLE 5093. Effective Leadership for School Improvement. 3 Hours.

A performance based examination of strategic planning, group facilitation and decision-making, organizational behavior and development, professional ethics and standards, student services administration, and principles of effective leadership. (Typically offered: Spring and Summer)

EDLE 574V. Internship. 1-6 Hour.

Supervised in-school/district experiences individually designed to afford opportunities to apply previously-acquired knowledge and skills in administrative workplace settings. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

EDLE 599V. Seminar. 1-6 Hour.

Important foundational topics in educational leadership that are current and critical will be taught in this Master's-level seminar. Topics range from the psychology of learning and leading to how schools and society interact in the 21st century. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

EDLE 6013. Problems of Practice for Educational Leaders. 3 Hours.

Problems of Practice is designed to extend and refine students' thinking, experience, and knowledge about the Education Doctorate (EdD), as well as selecting a Problem of Practice that can contribute to the following program goals: advanced analytical reasoning skills; positive impact on professional practice; and the refinement of the scholar-practitioner. (Typically offered: Summer)

EDLE 6023. School Facilities Planning and Management. 3 Hours.

School facilities planning, management, cost analysis, operations, and maintenance of the school plant. (Typically offered: Fall Odd Years)

EDLE 6053. School-Community Relations. 3 Hours.

Community analysis, politics and education; power groups and influences; school issues and public responses; local policy development and implementation; effective communication and public relations strategies. (Typically offered: Spring Even Years)

EDLE 605V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 6093. School District Governance: The Superintendency. 3 Hours.

Analysis of the organizational and governance structures of American public education at national, state, and local levels. (Typically offered: Fall Even Years)

EDLE 6103. School Finance. 3 Hours.

Principles, issues and problems of school funding formulae and fiscal allocations to school districts. (Typically offered: Spring Odd Years)

EDLE 6173. School Business Management. 3 Hours.

Fiscal and resource management in public schools: budgeting, insurance, purchasing, and accounting. (Typically offered: Summer Odd Years)

EDLE 6333. Advanced Legal Issues in Education. 3 Hours.

The examination and discussion of advanced legal issues affecting public school education. Prerequisite: Advanced graduate standing. (Typically offered: Fall Even Years)

EDLE 6433. Legal Aspects of Special Education. 3 Hours.

A study of litigation and legislation in special education, federal and state laws and court cases, and due process hearings. (Typically offered: Irregular)
This course is cross-listed with SPED 6433.

EDLE 6503. Topics in Educational Research for School Administration. 3 Hours.

Application of educational research in the school setting by educational administrators. Emphasis placed on the use of state and local school or district data, data analysis, interpretation and reporting, hands-on experience with SPSS, and the formal process of writing a research report. Prerequisite: Advanced graduate standing. (Typically offered: Fall Odd Years)

EDLE 6513. Program Evaluation in Education. 3 Hours.

Program Evaluation in Education is designed to introduce students to concepts and methods of policy and program evaluation. Emphasis will be placed on preparing educational leadership students to conduct a program evaluation specialist project of dissertation. (Typically offered: Summer)

EDLE 6533. Educational Policy. 3 Hours.

Examination of the research and theory related to the evolution of local, state, and federal governance and educational policy. Emphasis given to the consideration of procedures involving policy formulation, implementation, and analysis. (Typically offered: Spring Odd Years)

EDLE 6543. Introduction to Qualitative Research. 3 Hours.

This course offers an introduction to the qualitative approach to research in the Social Sciences. In particular, this course focuses on initial qualitative research designs that support planning, problem solving, and evaluation for educational leaders. Developing a conceptual framework, gaining an initial understanding of the methods of data collection and analysis, and establishing credibility in qualitative research are discussed. This course will be taught online using Blackboard and will require synchronous online class meetings that will require a webcam and microphone. (Typically offered: Fall)

EDLE 6553. Advanced Qualitative Methods in Educational Research. 3 Hours.

This course has been designed to provide graduate students with a more in-depth understanding of qualitative research methods. Emphasis will be placed on preparing educational leadership students to design a qualitative or mixed-method dissertation study. Prerequisite: ESRM 6543 or HRWD 572V. (Typically offered: Spring)

EDLE 674V. Internship. 1-6 Hour.

Internship. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 680V. Educational Specialist Project. 1-6 Hour.

An original project, research project, or report required of all Ed.S. Degree candidates. Prerequisite: Admission to the Ed.S. program. (Typically offered: Fall, Spring and Summer)

EDLE 699V. Seminar. 1-6 Hour.

Seminar. Prerequisite: Advanced graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Educational Statistics and Research Methods (ESRM)

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Educational Statistics and Research Methods website (<http://esrm.uark.edu>)

Degrees Conferred:
 Ph.D. in Educational Statistics and Research Methods (ESRM)

Graduate Certificates Offered (non-degree):
 Educational Psychology (EDPS)
 Educational Statistics and Research Methods (EDST)

Program Description: The Educational Statistics and Research Methods program develops professionals in the areas of educational research methods and policy studies, both through courses and Independent research. Graduates can obtain employment with school districts, educational agencies, and industries with internal data analysis needs.

Graduate Certificates

Admission to the Graduate Certificate Programs: In addition to meeting University requirements for admission to the Graduate School, applicants must have earned a master’s degree with a 3.25 cumulative GPA and minimum scores on the Graduate Record Examinations at the 48th percentile Verbal, the 56th percentile Quantitative and the 29th percentile on Analytic Writing OR be currently enrolled in a doctoral program at the University of Arkansas.

Certificate Requirements: Required list of courses for a certificate with a grade-point average of 3.50.

Doctor of Philosophy

Doctor of Philosophy in Educational Statistics and Research Methods: The increased emphasis on educational accountability and data-driven decision making to improve public school institutions, as well

as greater reliance on empirical research and analysis in public policy and educational studies, have led to a greater need for experts in educational statistics and research methods. The Educational Statistics and Research Methods doctoral program develops professionals who can lead in these areas through coursework and independent research in educational statistics, research design, assessment, and program evaluation.

Requirements for Ph.D. in Educational Statistics and Research Methods

Admission Requirements for the Ph.D. Degree: In addition to meeting University requirements for admission to the Graduate School, applicants should have an earned master’s degree with a minimum 3.25 GPA and scores on the Graduate Record Examinations at the 48th percentile Verbal, the 65th percentile Quantitative and the 48th percentile on Analytic Writing. Higher performance on the quantitative component of the GRE may compensate for a lower GPA in admissions decisions.

Requirements for the Ph.D. Degree: Students must complete all requirements of the Graduate School for the Doctor of Philosophy degree, and complete an approved program of study including a minimum of 36 credit hours of core courses, 9 hours of elective courses, and 18 credit hours of doctoral dissertation. Coursework must be completed with a cumulative grade average of at least 3.25, with no credit for courses with a grade of “C” or lower.

EDFD 5373	Psychological Foundations of Teaching and Learning	3
EDFD 5683	Issues in Educational Policy	3
ESRM 6403	Educational Statistics and Data Processing	3
ESRM 6413	Experimental Design in Education	3
ESRM 6423	Multiple Regression Techniques for Education	3
ESRM 6453	Applied Multivariate Statistics	3
ESRM 6513	Hierarchical Linear Modeling	3
ESRM 6523	Structural Equation Modeling	3
ESRM 6533	Qualitative Research	3
ESRM 6553	Advanced Multivariate Statistics	3
ESRM 6613	Evaluation of Policies, Programs, and Projects	3
ESRM 6653	Measurement and Evaluation	3
Select the following:		9
ESRM 5653	Educational Assessment	
ESRM 6753	Item Response Theory	
ESRM 699V	Seminar	
ESRM 700V	Doctoral Dissertation	18
Total Hours		63

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Certificate in Educational Psychology

Graduate Certificate in Educational Psychology:

The graduate certificate in Educational Psychology recognizes students who take a concentrated core of courses focused on educational psychology. Students who earn this certificate develop a foundational understanding of educational psychology theories, application of theory to educational practices and evaluation, and methods for identifying issues that arise in the learning process for learners of all ages.

Program Of Study

EDFD 5573	Life-Span Human Development	3
EDFD 5373	Psychological Foundations of Teaching and Learning	3
EDFD 5673		
EDFD 5773		
Select one of the following:		3
ESRM 5013	Research Methods in Education	
ESRM 5393	Statistics in Education and Health Professions	
ESRM 6403	Educational Statistics and Data Processing	
Total Hours		9

Other relevant graduate coursework will be allowed on a case-by-case basis, subject to Educational Statistics and Research Methods program faculty approval and topical relevancy to the graduate certificate and its aims.

Graduate Certificate in Educational Statistics and Research Methods**Graduate Certificate in Educational Statistics and Research Methods:**

The graduate certificate in Educational Statistics and Research Methods recognizes students who complete a core of courses focused on developing theoretical, application, and interpretative aspects of statistical techniques and research methods. Graduate students completing this certificate will also develop comprehensive programming and data management skills necessary for today's academic researcher.

Program Of Study

ESRM 6403	Educational Statistics and Data Processing	3
ESRM 6413	Experimental Design in Education	3
ESRM 6423	Multiple Regression Techniques for Education	3
ESRM 6453	Applied Multivariate Statistics	3
Select one of the following:		3
ESRM 5653	Educational Assessment	
ESRM 6653	Measurement and Evaluation	
Select one of the following:		3
ESRM 6513	Hierarchical Linear Modeling	
ESRM 6523	Structural Equation Modeling	
ESRM 6553	Advanced Multivariate Statistics	
ESRM 699V	Seminar	
Total Hours		18

Educational Foundations Courses**EDFD 5373. Psychological Foundations of Teaching and Learning. 3 Hours.**

Psychological principles and research applied to classroom learning and instruction. Social, emotional, and intellectual factors relevant to topics such as readiness, motivation, discipline, and evaluation in the classroom. (Typically offered: Irregular)

EDFD 5573. Life-Span Human Development. 3 Hours.

Basic principles of development throughout the human life-cycle. Physical, cognitive, social, emotional, and personality development. (Typically offered: Fall, Spring and Summer)

EDFD 5683. Issues in Educational Policy. 3 Hours.

This course examines how K-12 education policy is designed and implemented in the United States. Students will develop a working knowledge of policymaking frameworks to examine major education policies of current interest and debate key policy issues that arise at each level of government. (Typically offered: Fall, Spring and Summer)

This course is cross-listed with EDRE 6413.

Educational Statistics and Research Methods Courses**ESRM 5013. Research Methods in Education. 3 Hours.**

General orientation course which considers the nature of research problems in education and the techniques used by investigators in solving those problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

ESRM 5393. Statistics in Education and Health Professions. 3 Hours.

Applied statistics course for Master's degree candidates. Includes concepts and operations for frequency distributions, graphing techniques, measures of central tendency and variation, sampling, hypothesis testing, and interpretation of statistical results. (Typically offered: Fall, Spring and Summer)

ESRM 5653. Educational Assessment. 3 Hours.

Introduction to measurement issues and basic test theory. Focus on types and usage of assessment tools, data management, and analysis and interpretation of educational data. Practical training in the utilization and interpretation of academic achievement data in Arkansas. (Typically offered: Irregular)

ESRM 599V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ESRM 605V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer)

ESRM 6403. Educational Statistics and Data Processing. 3 Hours.

Theory and application of frequency distributions, graphical methods, central tendency, variability, simple regression and correlation indexes, chi-square, sampling, and parameter estimation, and hypothesis testing. Use of the computer for the organization, reduction, and analysis of data (required of doctoral candidates). Prerequisite: ESRM 5013 or ESRM 5393 or an equivalent course, each with a grade of C or better. (Typically offered: Fall, Spring and Summer)

ESRM 6413. Experimental Design in Education. 3 Hours.

Principles of experimental design as applied to educational situations. Special emphasis on analysis of variance techniques used in educational research. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Spring)

ESRM 6423. Multiple Regression Techniques for Education. 3 Hours.

Introduction to multiple regression procedures for analyzing data as applied in educational settings, including multicollinearity, dummy variables, analysis of covariance, curvi-linear regression, and path analysis. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Fall)

ESRM 6453. Applied Multivariate Statistics. 3 Hours.

Multivariate statistical procedures as applied to educational research settings including discriminant analysis, principal components analysis, factor analysis, canonical correlation, and cluster analysis. Emphasis on use of existing computer statistical packages. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Spring)

ESRM 6513. Hierarchical Linear Modeling. 3 Hours.

This course covers the theory and applications of hierarchical linear modeling (HLM) also known as multilevel modeling. Both the conceptual and methodological issues for analyses of nested (clustered) data in using HLM will be reviewed, including linear models, non-linear models, growth models, and some alternative designs. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Fall Even Years)

ESRM 6523. Structural Equation Modeling. 3 Hours.

This course provides a detailed introduction to structural equation modeling (SEM) based on students' previous knowledge of multiple linear regression. Topics include path analysis, confirmatory factor analysis, full latent variable models, estimation techniques, data-model fit analysis, model comparison, and other topics, potentially equivalent models, specification searches, latent mean models, parameter invariance, multi-group models, and models of discrete data. Prerequisite: ESRM 6423 with a grade of C or better. (Typically offered: Spring)

ESRM 6533. Qualitative Research. 3 Hours.

Introduction of non-quantitative methods, including data collection through interviews, field observation, records research, internal and external validity problems in qualitative research. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall and Spring)

ESRM 6543. Advanced Qualitative Research. 3 Hours.

Preparation for the conduct of qualitative research, structuring, literature reviews, data collection and analysis, and reporting results. Prerequisite: ESRM 6533 with a grade of C or better. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

ESRM 6553. Advanced Multivariate Statistics. 3 Hours.

Builds on the foundation provided in Multivariate and introduces techniques that extend methodological elements of canonical, discriminant, factor analytic, and longitudinal analyses, providing the mathematical and theoretical foundations necessary for these designs. Prerequisite: ESRM 6453 with a grade of C or better. (Typically offered: Spring Even Years)

ESRM 6613. Evaluation of Policies, Programs, and Projects. 3 Hours.

Introduction to evaluation in social science research, including why and how evaluations of programs, projects, and policies are conducted; includes analysis of actual evaluations in a variety of disciplines. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)

This course is cross-listed with EDRE 6213.

ESRM 6653. Measurement and Evaluation. 3 Hours.

Fundamentals of measurement: scales, scores, norms, reliability, validity. Test and scale construction and item analysis. Standardized measures and program evaluation models in decision making. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)

ESRM 668V. Practicum in Research. 1-6 Hour.

Practical experience in educational research on campus, in school systems, or in other agencies in educational program development. (Typically offered: Irregular)

ESRM 6753. Item Response Theory. 3 Hours.

Topics of measurement in the psychometric field focusing on item response theory; item level and test level analyses including differential item functioning, test dimensionality, computer adaptive testing, equating, and general evaluation and usage of measurement instruments. Prerequisite: ESRM 6653 with a grade of C or better. (Typically offered: Spring Odd Years)

ESRM 699V. Seminar. 1-6 Hour.

Seminar. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Educational Technology (ETEC)

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Educational Technology Website (<http://etec.uark.edu/>)

Degrees Conferred:

M.Ed. in Educational Technology (ETEC)

Graduate Certificates Offered (non-degree):

K-12 Online Teaching (p. 347) (ETEC)

Program Description: The Educational Technology Program is a 33-hour non-thesis on-line master's program that prepares students for professional positions as educational technologists of education, business, government, and the health professions. It also offers a 15-hour certificate program that prepares K-12 teachers to plan, create, provide, and assess effective instruction within online K-12 environments.

Primary Areas of Faculty Research: Curricular integration of technology, distance learning, instructional design, policies and best practices in online learning, vulnerable populations, virtual schools, cyber schools, immersive learning environments.

M.Ed. in Education Technology

Prerequisites to Degree Programs: Applicants for the M.Ed. degree must have completed a bachelor's degree and earned a 3.00 GPA on the last 60 hours of undergraduate course. Applicants with an earned GPA of 2.7-2.9 on the last 60 hours of undergraduate course work may be considered if an acceptable score on the Graduate Record Examination or Miller Analogies Test is obtained.

Requirements for the Master of Education Degree: In addition to the general requirements of the Graduate School, students must complete a minimum of 33 hours of graduate course work to include 21 semester hours of core educational technology courses and 9 semester hours of elective curriculum and instruction or educational technology courses. Additionally, a Culminating Student Portfolio must be successfully completed in the last semester of course work in the ETEC 5373 Designing Web Sites and ePortfolios course and will replace the Graduate School requirement of a comprehensive examination.

Degree Requirements: (33 hours)

1. Educational Technology Core: 21 hours
2. Educational Technology Electives: 9 hours
3. Culminating Student Portfolio: 3 hours completed during the last semester of course work in the ETEC 5373 Designing Web Pages and ePortfolios course.

Required ETEC Courses

ETEC 5203	Foundations of Educational Technology	3
ETEC 5213	Designing Educational Media	3

ETEC 5243	Designing Technology Based Instruction: Theories and Models	3
ETEC 5313	Principles in Visual Literacy	3
ETEC 5373	Designing Web Sites and ePortfolios	3
ETEC 6223	Research and Strategic Planning in Educational Technology	3
ETEC 6253	Teaching and Learning at a Distance	3
Elective ETEC Courses		
Select three of the following:		9
ETEC 5263	Grant Writing in Educational Technology	
ETEC 6393	Issues and Trends in Designing Instruction with Technology	
CIED 5363	Teaching in K-12 Online and Blended Classrooms	
CIED 5423	Curriculum and Instruction: Models and Implementation	
Culminating EPortfolio		3
A Culminating Electronic Student Portfolio must be successfully completed in the last semester of course work in ETEC 5373 Designing Web Sites and ePortfolios course.		
Total Hours		33

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Courses

ETEC 5203. Foundations of Educational Technology. 3 Hours.

Provides learners with a comprehensive survey of the major trends, issues, people, processes, and products that have significantly affected the evolution of the field of educational technology. (Typically offered: Spring and Summer)

ETEC 5213. Designing Educational Media. 3 Hours.

Instruction in the design, development and implementation of various types of web based audio and visual media for enhancing instruction. Prerequisite: Graduate standing. (Typically offered: Fall)

ETEC 5243. Designing Technology Based Instruction: Theories and Models. 3 Hours.

The study and application of theories, models and methods for designing and developing instruction which utilizes technology tools and applications. Prerequisite: Graduate standing. (Typically offered: Fall)

ETEC 5263. Grant Writing in Educational Technology. 3 Hours.

Students will have an opportunity to find grant funding sources, write a grant, and submit an actual grant proposal to an agency for consideration. Will survey research in instructional media over the past 60 years and learn specific criteria for reading and evaluating research reports and articles. Will investigate current issues and topics related to research and grant writing in instructional media. (Typically offered: Summer)

ETEC 5303. Teaching with Technology in the K-12 Classroom. 3 Hours.

A study of learning theories and technologies that can be utilized to support and to enhance instruction in multiple subject areas in the K-12 classroom. Prerequisite: Graduate standing. (Typically offered: Spring)

ETEC 5313. Principles in Visual Literacy. 3 Hours.

Students gain understanding of visual literacy research and learn to create graphics that support learning. Literature in the area of visual literacy and learning theories as well as tools that facilitate effective visual literacy will be used to create visuals that are clear, communicate well, and help enhance learner performance. (Typically offered: Spring and Summer)

ETEC 5373. Designing Web Sites and ePortfolios. 3 Hours.

Students design websites for content delivery with a focus upon multiple platforms, effective design principles, accessibility, and copyright compliance. They will apply these concepts in the design of an ePortfolio showcasing skills as an educational technology practitioner. Prerequisite: Educational Technology Master of Education (ETECME) major, and course must be taken in the final semester of ETECME program. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

ETEC 5743. Internship. 3 Hours.

A supervised field placement in educational technology that provides experience consistent with the student's professional goals and training emphasis. Internship experiences are planning and directed under the guidance of a faculty member. On-campus and on-site supervision is required. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ETEC 5981. Eportfolio Production. 1 Hour.

This is a capstone course that is typically taken in the last semester of coursework and designed to: 1) review key constructs presented within the Educational Technology curriculum; 2) provide ETEC students the opportunity for reflection relative to his/her learning of the key concepts; and 3) utilize technology to assemble student-created artifacts that demonstrate mastery of the key concepts. (Typically offered: Fall and Spring)

ETEC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ETEC 6223. Research and Strategic Planning in Educational Technology. 3 Hours.

The course provides an overview of quantitative, qualitative, mixed methods research and experiences intended to develop strategic planning knowledge, values, attitudes, and skills in the management and leadership in educational technology and instructional design programs. (Typically offered: Fall)

ETEC 6243. Advanced Instructional Design. 3 Hours.

This course explores advanced topics in instructional design to facilitate understanding of grounded models, advanced theories, and research. This course focuses on: 1) design and development of contextualized technology-supported learning environments; 2) analysis and application of advanced theoretical foundations of design; and 3) examination and critique of instructional design research. Prerequisite: ETEC 5243 or equivalent. (Typically offered: Spring)

ETEC 6253. Teaching and Learning at a Distance. 3 Hours.

An examination of methods and technologies for teaching instructional content at a distance. Emphasis is on techniques for the development, utilization and evaluation of technology integration for instruction in a variety of learning environments. (Typically offered: Spring and Summer)

ETEC 6393. Issues and Trends in Designing Instruction with Technology. 3 Hours.

Critical challenges posed as a result of the increasing infusion of technology into the school and training environments are explored. The course prepares students to make and defend policy decisions and become conversant with current trends and issues in the field. (Typically offered: Fall)

Electrical Engineering (ELEG)

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Electrical Engineering Website (<http://electrical-engineering.uark.edu/>)

Degrees Conferred:

M.S.E.E. (ELEG)

Ph.D. in Engineering (ELEG) (See Engineering (p. 127))

Primary Areas of Faculty Research: Communications, digital signal processing and sensor networks; electronics and electronic packaging, analog and mixed signal, and integrated circuits; power systems, power electronics, renewable energy and control; RF and microwave, electromagnetics, antennas, and terahertz; semiconductors, nanotechnology, optoelectronics, photovoltaic and photonics

M.S.E.E. in Electrical Engineering

Requirements for Admission: A student must have a grade point average of at least 3.0 (based on a 4.0 system) on all undergraduate work, or a 3.0 average or above on the last 60 hours of undergraduate coursework.

Requirements for Graduate Degrees: In addition to the requirements of the Graduate School and the College of Engineering, the following departmental requirements must be satisfied by candidates for advanced degrees in electrical engineering.

1. Candidates for the Master of Science degree who present a thesis are required to complete a minimum of 24 semester hours of course work and six semester hours of thesis.
2. Candidates for the Master of Science degree who do not present a thesis are required to complete a minimum of 30 semester hours of course work.
3. Course work presented for the degree of Master of Science must include a minimum of 12 semester hours at the 5000- or 6000-level in electrical engineering. At least 15 (21 for non-thesis option) hours of the student's graduate course work must be ELEG courses. No more than six hours of ELEG 588V may be presented for degree credit.
4. Students who complete a B.S. degree in Electrical Engineering at the University of Arkansas, Fayetteville, with a GPA of 3.5 or greater may count towards the M.S. degree up to six hours of ELEG graduate-level coursework completed as an undergraduate student.
5. Students who are applying for the coursework-only M.S.E.E. degree through distance education may have the GRE requirement waived providing the student meets the following conditions. The student must meet the following three criteria:
 - a. The student has passed an equivalent exam (like the Fundamentals of Engineering);
 - b. The student has a B.S. degree in electrical engineering from an ABET-Accredited program, or already completed a graduate degree (M.Sc. or higher) in an engineering related field; and
 - c. The student has at least one year of professional working experience after completing a baccalaureate degree.
6. Candidates for the M.S.E.E. degree must take an M.S. Readiness Assessment exam during their first semester of graduate work. This

exam is administered by the student's major professor and advisory committee, and is designed to assess the student's undergraduate preparation for his or her graduate work. The student may be required to take whatever undergraduate courses are deemed necessary in addition to the graduate courses specified in items 1-3.

7. The M.S.E.E. degree includes a distance education option for which students complete most or all of their coursework using distance education courses. The use of this option is subject to approval by the student's major professor, and to the availability of sufficient distance education courses in the student's specialty areas to enable completion of the M.S.E.E.
8. The M.S.E.E. degree will allow transfer of up to nine credit hours of graduate level coursework from universities with which the University of Arkansas has a '1+1' M.S.E.E. exchange program. This is an exception to the Graduate School rule that only six hours may be transferred. Each course transferred must be graduate level, and must be approved for transfer by the Electrical Engineering Graduate Committee. The transferred courses will not count toward the M.S.E.E. requirement for 5000 or 6000 level ELEG courses.
9. Any other conditions as stipulated in the departmental guidelines for master's degrees.

Ph.D. in Electrical Engineering

In addition to the requirements of the graduate school, the program of study for the Ph.D. degree must satisfy the following:

1. The Ph.D. degree requires 36 hours of coursework, as follows:
 - a. A student entering the Ph.D. program with a B.S.E.E. will be required to complete a minimum of 36 hours of graded coursework.
 - b. A student entering the Ph.D. program with an M.S. degree will be required to complete a minimum of an additional 12 hours of graded coursework on the University of Arkansas, Fayetteville, campus.
 - c. All Ph.D. students must complete a minimum of 12 hours of graded coursework on the University of Arkansas, Fayetteville, campus.
2. The course work specified in item (a) must include a minimum of 30 hours of course work at the 5000 and 6000 level, and at least 24 of these 5000- and 6000-level hours must be in electrical engineering.
3. The course work specified in item (a) must include GRSD 5003 or MSEN 5383.
4. The doctoral program must include at least 72 hours of course work and thesis or dissertation hours. A maximum of six of these hours may be thesis hours. The remaining hours that are not course work must be dissertation. The Graduate School requires a minimum of 18 hours of dissertation for graduation.
5. Candidates for the Ph.D. degree must take a Ph.D. Readiness Assessment exam during their first semester of graduate work. This exam is administered by the student's major professor and advisory committee, and is designed to assess the student's readiness to conduct research during his or her graduate work. The student may be required to take whatever undergraduate courses are deemed necessary in addition to the graduate courses specified above.
6. It is emphasized that the course work specified above represents minimums, and many students' programs will include more than this minimum, particularly if the student has an M.S.E.E. degree from a school that is not a recognized graduate school in the United States.

Graduate Faculty

Ang, Simon S., Ph.D. (Southern Methodist University), M.S.E.E. (Georgia Institute of Technology), B.S.E.E. (University of Arkansas), Professor, 1988.

Balda, Juan Carlos, Ph.D. (University of Natal), B.S. (Universidad Nacional del Sur), University Professor, 1989.

Chen, Zhong, Ph.D. (North Carolina State University), M.Eng. (National University of Singapore), B.S. (Zhejiang University), Assistant Professor, 2015.

Dix, Jeffrey, Ph.D., M.S., B.S.E.E., (University of Tennessee, Knoxville), Assistant Professor, 2018.

El-Ghazaly, Samir M., Ph.D. (University of Texas at Austin), M.S., B.S. (Cairo University), Distinguished Professor, 2007.

El-Shenawee, Magda O., Ph.D. (University of Nebraska-Lincoln), M.S., B.S. (Assiut University, Egypt), Professor, 2001.

Luo, Fang, Ph.D. (Huazhong University of Science and Technology), Assistant Professor, 2017.

Manasreh, Omar, Ph.D. (University of Arkansas), M.S. (University of Puerto Rico-Rio Piedras), B.S. (University of Jordan), Professor, 2003.

Mantooth, Alan, Ph.D. (Georgia Institute of Technology), M.S., B.S. (University of Arkansas), Distinguished Professor, 1998.

Martin, Terry W., Ph.D., M.S.E.E., B.S.E.E. (University of Arkansas), Professor, 1990.

McCann, Roy A., Ph.D. (University of Dayton), M.S.E.E., B.S.E.E. (University of Illinois), Professor, 2003.

Naseem, Hameed A., Ph.D., M.S. (Virginia Polytechnic State University), M.Sc. (Panjab University), University Professor, 1985.

Saunders, Robert F., M.S.E.E., M.S. (University of Arkansas), Instructor, 2012.

Spieshoefer, Silke, Ph.D., M.S.E.E., B.S.Ch.E. (University of Arkansas), Clinical Assistant Professor, 2014.

Ware, Morgan, Ph.D. (North Carolina State University), B.S. (Florida State University), Assistant Professor, 2005.

Wu, Jingxian, Ph.D. (University of Missouri-Columbia), M.S. (Tsinghua University), B.S. (Beijing University of Aeronautics and Astronautics), Associate Professor, 2008.

Yu, Fisher, Ph.D. (Arizona State University), M.S., B.S. (Peking University), Associate Professor, 2008.

Zhao, Yue, Ph.D. (University of Nebraska-Lincoln), B.S. (Beijing University), Assistant Professor, 2015.

Courses

ELEG 5173L. Digital Signal Processing Laboratory. 3 Hours.

Use of DSP integrated circuits. Lectures, demonstrations, and projects. DSP IC architectures and instruction sets. Assembly language programming. Development tools. Implementation of elementary DSP operations, difference equations, transforms and filters. Prerequisite: ELEG 3124. (Typically offered: Irregular)

ELEG 5203. Semiconductor Devices. 3 Hours.

Crystal properties and growth of semiconductors, energy bands and charge carriers in semiconductors, excess carriers in semiconductors, analysis and design of p/n junctions, analysis and design of bipolar junction transistors, and analysis and design of field-effect transistors. Students may not receive credit for both ELEG 4203 and ELEG 5203. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5213. Integrated Circuit Fabrication Technology. 3 Hours.

Theory and techniques of integrated circuit fabrication technology; crystal growth, chemical vapor deposition, impurity diffusion, oxidation, ion implantation, photolithography and metallization. Design and analysis of device fabrication using SUPREM and SEDAN. In-process analysis techniques. Student review papers and presentations on state of the art fabrication and device technology. Prerequisite: ELEG 4203 or ELEG 5203. (Typically offered: Irregular)

ELEG 5223. Design and Fabrication of Solar Cells. 3 Hours.

Solar insolation and its spectral distribution/ p-n junction solar cells in dark and under illumination; solar cell parameters efficiency limits and losses; standard cell technology; energy accounting; design of silicon solar cells using simulation; fabrication of designed devices in the lab and their measurements. Students cannot receive credit for both ELEG 4223 and ELEG 5223. Prerequisite: ELEG 4203 or ELEG 5203. (Typically offered: Irregular)

ELEG 5243L. Microelectronic Fabrication Techniques and Procedures. 3 Hours.

The Thin-Film Fabrication course is designed to prepare students to use the thin-film equipment and processes available at the Engineering Research Center's thin-film cleanroom. The process modules to be trained on include lithography, metal deposition and etching, oxide deposition, growth and etching, reactive dry etching, tantalum anodization, photodefinable spin-on dielectric and electroplating. The related metrology modules include microscope inspection, spectrophotometric measurement of oxide, profilometry and four-point probe measurements. Prerequisite: ELEG 5273. (Typically offered: Irregular)

ELEG 5253L. Integrated Circuit Design Laboratory I. 3 Hours.

Design and layout of large scale digital integrated circuits. Students design, check, and simulate digital integrated circuits which will be fabricated and tested in I.C. Design Laboratory II. Topics include computer-aided design, more in-depth coverage of topics from ELEG 4233, and design of very large scale chips. Prerequisite: ELEG 4233 or ELEG 5923. (Typically offered: Irregular)
This course is cross-listed with CSCE 5253L.

ELEG 5273. Electronic Packaging. 3 Hours.

An introductory treatment of electronic packaging, from single chip to multichip, including materials, substrates, electrical design, thermal design, mechanical design, package modeling and simulation, and processing considerations. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5293L. Integrated Circuits Fabrication Laboratory. 3 Hours.

Experimental studies of silicon oxidation, solid-state diffusion, photolithographical materials and techniques, bonding and encapsulation. Fabrication and testing of PN diodes, NPN transistors and MOS transistors. Prerequisite: ELEG 5213. (Typically offered: Irregular)

ELEG 5303. Introduction to Nanomaterials and Devices. 3 Hours.

(Formerly ELEG 4303.) This course provides the students with an introduction to nanomaterials and devices. The students will be introduced to the quantization of energy levels in nanomaterials, growth of nanomaterials, electrical and optical properties, and devices based on these nanomaterials, such as tunneling resonant diodes, transistors, detector, and emitters. Graduate students will be given additional or different assignments. Graduate students will be expected to explore and demonstrate an understanding of the material with a greater level of depth and breadth than the undergraduates. Each group of students will have different expectations and grading systems. The instructor will prepare and distribute two distinct syllabi. Corequisite: ELEG 4203. Prerequisite: ELEG 3214 and PHYS 2074. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ELEG 5313. Power Semiconductor Devices. 3 Hours.

Carrier transport physics; breakdown phenomenon in semiconductor devices; power bipolar transistors, thyristors, power junction field-effect transistors, power field-controlled diodes, power metal-oxide-semiconductor field-effect transistors, and power MOS-bipolar devices. Prerequisite: ELEG 4203 or graduate standing. (Typically offered: Irregular)

ELEG 5323. Semiconductor Nanostructures I. 3 Hours.

This course is focused on the basic theoretical and experimental analyses of low dimensional systems encountered in semiconductor heterojunctions and nanostructures with the emphasis on device applications and innovations. Prerequisite: ELEG 4203 or instructor permission. (Typically offered: Irregular)

ELEG 5333. Semiconductor Nanostructures II. 3 Hours.

This course is a continuation of ELEG 5323 Semiconductors Nanostructures I. It is focused on the transport properties, growth, electrical and optical properties of semiconductor nanostructures, and optoelectronic devices. Prerequisite: ELEG 5323 or instructor permission. (Typically offered: Irregular)

ELEG 5343. Organic Electronics Technology. 3 Hours.

Students become familiar with recent developments in and process technology for organic material based devices and sensors in the classroom, but also gain hands on experience with fabrication processes using micro-fabrication tools in the lab. (Typically offered: Irregular)

ELEG 5353. Semiconductor Optoelectronic Devices. 3 Hours.

This course will provide graduate students a detailed background in semiconductor optoelectronic devices such as light emitting diodes and lasers, photodetectors, solar cells, modulators. The applications of these devices will also be discussed. Prerequisite: ELEG 4203 or ELEG 5203. (Typically offered: Spring Odd Years)

ELEG 5363. Semiconductor Material and Device Characterization. 3 Hours.

This course provides an overview of semiconductor characterization techniques in industry: Electrical measurements, Optical measurements, Electron and ion beam measurements, X-ray and probe measurements. Prerequisite: ELEG 4203 or ELEG 5203 and instructor consent. (Typically offered: Irregular)

ELEG 5383. Introduction of Integrated Photonics. 3 Hours.

This course is designed to provide junior and senior graduate students detailed knowledge of integrated photonics by using silicon photonics as an example. The course covers a cycle of design, fabrication, and testing of photonic devices by using analytic and numerical methods. The course will focus on designing an interferometer, which is widely used in communication and sensing applications. Students will be exposed to use the state-of-art design simulation tool, Lumerical, to design the photonic circuits and to evaluate the performances. In the course project, students will extend the design rules to design a set of components to be used for integrated microwave photonics based on Ge on Si, SiGeSn, or Si₃N₄ on sapphire platform. Prerequisite: ELEG 4203 and ELEG 5353. (Typically offered: Irregular)

ELEG 5393. Electronic Materials. 3 Hours.

This is a lecture course designed to provide a fundamental introduction to materials science. Upon this fundamental basis, we will survey many of the properties and materials relevant to modern electronics. This course will cover semiconductors, but only briefly. The focus will be on properties and materials not generally well covered in other electrical engineering courses from a materials perspective. This will include, but not be limited to metals, dielectrics, and magnetic and optical materials. Prerequisite: Graduate standing; A knowledge of quantum mechanics is helpful but not required. (Typically offered: Spring)

ELEG 5403. Control Systems. 3 Hours.

Mathematical modeling of dynamic systems, stability analysis, control systems architectures and sensor technologies. Time-domain and frequency-domain design of feedback control systems: lead, lag, PID compensators. Special topics on microprocessor implementation. Credit not given for both ELEG 4403 and ELEG 5403. Prerequisite: Graduate standing or ELEG 3124. (Typically offered: Irregular)

ELEG 5413. Modern Control Systems. 3 Hours.

A second course in linear control systems. Emphasis on multiple-input and multiple-output systems: State-space analysis, similarity transformations, eigenvalue and eigenvector decomposition, stability in the sense of Lyapunov, controllability and observability, pole placement, quadratic optimization. Credit not given for both ELEG 4413 and ELEG 5413. Prerequisite: ELEG 5403 or equivalent. (Typically offered: Irregular)

ELEG 5423. Optimal Control Systems. 3 Hours.

Basic concepts, conditions for optimality, the minimum principle, the Hamilton Jacobi equation, structure and properties of optimal systems. Prerequisite: ELEG 4403 or graduate standing. (Typically offered: Irregular)

ELEG 5443. Nonlinear Systems Analysis and Control. 3 Hours.

Second-order nonlinear systems. Nonlinear differential equations. Approximate analysis methods. Lyapunov and input-output stability. Design of controllers, observers, and estimators for nonlinear systems. Prerequisite: ELEG 4403 or graduate standing. (Typically offered: Irregular)

ELEG 5473. Power System Operation and Control. 3 Hours.

Study of the control and operation of electric power systems: Modeling, dynamics, and stability of three-phase power systems. Design and implementation of control systems related to generation and transmission. Overview of the related industry and government regulations for power system protection and reliability. Prerequisite: ELEG 4403 or graduate standing. (Typically offered: Irregular)

ELEG 5503. Design of Advanced Power Distribution Systems. 3 Hours.

Design considerations of electric power distribution systems, including distribution transformer usage, distribution system protection implementation, primary and secondary networks design, applications of advanced equipment based on power electronics, and use of capacitors and voltage regulation. Students may not receive credit for both ELEG 4503 and ELEG 5503. Prerequisite: ELEG 3304 or graduate standing. (Typically offered: Irregular)

ELEG 5513. Power Systems Analysis. 3 Hours.

Modeling and analysis of electric power systems: Energy sources and conversion; load flow analysis; reference frame transformations; symmetrical and unsymmetrical fault conditions; load forecasting and economic dispatch. Credit not given for both ELEG 4513 and ELEG 5513. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5523. Electric Power Quality. 3 Hours.

The theory and analysis of electric power quality for commercial, industrial and residential power systems. Specific topics include harmonics, voltage sags, wiring and grounding, instrumentation, distributed generation and power electronic systems, and site surveys. Case studies complement the theoretical concepts. Prerequisite: ELEG 3304 or graduate standing. (Typically offered: Irregular)

ELEG 5533. Power Electronics and Motor Drives. 3 Hours.

Fundamentals of power electronics, diode bridge rectifiers, inverters, general concepts on motor drives, induction motor drives, synchronous motor drives, and dc motor drives. Students may not receive credit for both ELEG 4533 and ELEG 5533. Prerequisite: Graduate standing or ELEG 3224 and ELEG 3304. (Typically offered: Irregular)

ELEG 5543. Introduction to Power Electronics. 3 Hours.

Presents basics of emerging areas in power electronics and a broad range of topics such as power switching devices, electric power conversion techniques and analysis, as well as their applications. Students may not receive credit for both ELEG 5543 and ELEG 4543. Prerequisite: ELEG 2114 and ELEG 3214, or graduate standing. (Typically offered: Irregular)

ELEG 5553. Switch Mode Power Conversion. 3 Hours.

Basic switching converter topologies, control scheme of switching converters, simulation of switching converters, resonant converters, isolated converters, dynamic analysis of switching converters. Students will not receive graduate credit for both ELEG 4553 and ELEG 5553. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5563. EMI in Power Electronics Converters: Generation, Propagation and Mitigation. 3 Hours.

Concepts of electro-magnetic-interference issues in power electronics converters. Basic concepts of EMI measurement, modeling and mitigation, with a focus on conducted EMI in power electronics converters. The course is structured with lectures and a lab session. Students can not receive credit for both ELEG 4563 and ELEG 5563. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5623. Information Theory. 3 Hours.

Continuous and discrete source and channel models, measure of information, channel capacity, noisy-channel coding theorem, coding and decoding techniques. Prerequisite: ELEG 3143 or ELEG 4623 or graduate standing. (Typically offered: Irregular)

ELEG 5633. Detection and Estimation. 3 Hours.

Binary and multiple decisions for single and multiple observations; sequential, composite, and non-parametric decision theory; estimation theory; sequential, non-linear, and state estimation; optimum receiver principles. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5663. Communication Theory. 3 Hours.

Principles of communications. Channels and digital modulation. Optimum receivers and algorithms in the AWGN and fading channels. Coherent, non-coherent detectors and matched filters. Bounds on the performance of communications, and comparison of communications systems. Background in stochastic processes and probabilities, communication systems is desirable. Students may not receive credit for both ELEG 4623 and ELEG 5663. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

ELEG 5693. Wireless Communications. 3 Hours.

Comprehensive course in fast developing field of wireless mobile/cellular personal telecommunications. Topics include cellular system structures, mobile radio propagation channels, etc. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5703. RF & Microwave Design. 3 Hours.

An introduction to microwave design principles. Transmission lines, passive devices, networks, impedance matching, filters, dividers, and hybrids will be discussed in detail. Active microwave devices will also be introduced. In addition, the applications of this technology as it relates to radar and communications systems will be reviewed. Selected topics for device fabrication and measurements will be covered. Cannot get credit if student has taken ELEG 4703. Prerequisite: ELEG 3704. (Typically offered: Irregular)

ELEG 5723. Advanced Microwave Design. 3 Hours.

This course is an advanced course in microwave design building on the introduction to microwave design course. A detailed discussion of active devices, biasing networks, mixers, detectors, Microwave Monolithic Integrated Circuits (MMIC), and wideband matching networks will be provided. In addition, a number of advanced circuits will be analyzed. Prerequisite: ELEG 3704 and ELEG 4703 or ELEG 5703. (Typically offered: Irregular)

ELEG 5763. Advanced Electromagnetic Scattering & Transmission. 3 Hours.

Reflection and transmission of electromagnetic waves from a flat interface, the Poynting theorem, the complex and average power, the rectangular wave guides, TE and TM modes, radiation from antennas in free space and introduction to computational electromagnetics. Prerequisite: ELEG 3704. (Typically offered: Irregular)

ELEG 5773. Electronic Response of Biological Tissues. 3 Hours.

Understand the electric and magnetic response of biological tissues with particular reference to neural and cardiovascular systems. Passive and active forms of electric signals in cell communication. We will develop the central electrical mechanisms from the membrane channel to the organ, building on those that are common to many electrically active cells in the body. Analysis of Nernst equation, Goldman equation, linear cable theory, and Hodgkin-Huxley Model of action potential generation and propagation. High frequency response of tissues to microwave excitation, dielectric models for tissue behavior, Debye, Cole-Cole models. Role of bound and free water on tissue properties. Magnetic response of tissues. Experimental methods to measure tissue response. Applications to Electrocardiography & Electroencephalography, Microwave Medical Imaging, RF Ablation will be discussed. Students may not receive credit for both ELEG 4773 and ELEG 5773. Prerequisite: MATH 2584, ELEG 3704 or BIOL 2533 or equivalent. (Typically offered: Irregular)

ELEG 5783. Introduction to Antennas. 3 Hours.

Basic antenna types: small dipoles, half wave dipoles, image theory, monopoles, small loop antennas. Antenna arrays: array factor, uniformly excited equally spaced arrays, pattern multiplication principles, nonuniformly excited arrays, phased arrays. Use of MATLAB programming and mathematical techniques for antenna analysis and design. Emphasis will be on using simulation to visualize variety of antenna radiation patterns. Students cannot get credit for ELEG 5783 if they have taken ELEG 4783. Prerequisite: ELEG 3704. (Typically offered: Irregular)

ELEG 587V. Special Topics in Electrical Engineering. 1-3 Hour.

Consideration of current electrical engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

ELEG 588V. Special Problems. 1-6 Hour.

Opportunity for individual study of advanced subjects related to a graduate electrical engineering program to suit individual requirements. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ELEG 5903. Engineering Technical Writing. 3 Hours.

In this course, advanced graduate students (PhD candidates and selected MS students) will be trained in rephrasing and preparing technical papers, including scientific reports. Illustrations step by step will be explained. Each student is required to prepare technical papers based on their own research results and will be guided from selecting a title to a finished product. The emphasis will be placed on the structures of the articles including figures and table preparation, abstract writing, citations and references, and acknowledgments. The students will also be trained to prepare letters to the journals' editors and how to respond to reviewers' comments. Prerequisite: Graduate standing. (Typically offered: Fall)

ELEG 5914. Advanced Digital Design. 4 Hours.

To master advanced logic design concepts, including the design and testing of synchronous and asynchronous combinational and sequential circuits using state of the art CAD tools. Students may not receive credit for both ELEG 5914 and ELEG 4914 or CSCE 4914 and CSCE 5914. Corequisite: Lab component. Prerequisite: ELEG 2904 or CSCE 2114. (Typically offered: Irregular) This course is cross-listed with CSCE 5914.

ELEG 5923. Introduction to Integrated Circuit Design. 3 Hours.

Design and layout of large scale digital integrated circuits using CMOS technology. Topics include MOS devices and basic circuits, integrated circuit layout and fabrication, dynamic logic, circuit design, and layout strategies for large scale CMOS circuits. Students may not receive credit for both ELEG 4233 and ELEG 5923. Prerequisite: ELEG 3214 or ELEG 3933 and MATH 2584. (Typically offered: Fall)

ELEG 5953. Semiconductor Device and IC ESD Reliability. 3 Hours.

This course will cover semiconductor device and IC ESD design. The course is structured with lecture sessions and is offered to graduate students. The objective of this course is for students to understand semiconductor device and IC ESD design. Students will be able to demonstrate understanding of the basic concepts of ESD on-chip and off-chip protection for ICs and the future trends in ESD protections for advanced and emerging ICs. Prerequisite: ELEG 5923. (Typically offered: Irregular)

ELEG 5983. Computer Architecture. 3 Hours.

(Formerly ELEG 4983.) Design of a single board computer including basic computer organization, memory subsystem design, peripheral interfacing, DMA control, interrupt control, and bus organization. Prerequisite: ELEG 3924. (Typically offered: Irregular)

ELEG 5993. Mixed-signal Modeling and Simulation. 3 Hours.

Study of basic analog, digital & mixed signal simulation solution methods. Modeling with hardware description languages. Use of state-of-the-art simulators and HDLs. Students may not receive credit for both ELEG 4293 and ELEG 5993. Prerequisite: ELEG 3224 or graduate standing. (Typically offered: Irregular)

ELEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ELEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Elementary Education (ELED)

Ed Bengtson
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Degree Conferred:
 M.A.T. in Elementary Teaching

Graduate Certificates Offered (non-degree):
 STEM Education for Early Childhood (p. 349) (K-4)

Program Description: The University of Arkansas offers the Bachelor of Science (B.S.E.) degree in Childhood Education and the Master of Arts in Teaching (M.A.T.) degree in Elementary Education. These combined degree programs are one of the options at the University of Arkansas that lead to initial teacher licensure in Elementary Education (Pre-Kindergarten through Grade 6). Students who obtain their B.S.E. degree from the University of Arkansas will have completed the prerequisite course requirements for entry into the M.A.T. program. Students who obtain a bachelors degree from another university and/or in a program area other than Elementary Education must have their transcripts evaluated by a Elementary Education program adviser to determine what deficiencies must be met before they can be considered for admission into the M.A.T. program. The M.A.T. degree program is a 33-semester-hour program. To be recommended for licensure by the University of Arkansas, Fayetteville, campus, students must complete the M.A.T. degree program or the undergraduate Elementary Licensure program (see undergraduate catalog for more information). Students also choose a concentration from among English as a Second Language, Reading, Gift and Talented, or STEM Education.

The program also offers coursework toward a graduate certificate in STEM Education for Early Childhood (K-4).

M.A.T. in Elementary Education with ESL for K-6 Candidates Concentration

See also the general Graduate School requirements (p. 451) for the M.A.T. Degree.

Prerequisites to Degree Program

Enrollments will be limited in upper division professional studies courses in the Childhood Education B.S.E. Program. In addition, the number of students accepted into the M.A.T. Program in Elementary Education will be contingent upon availability of placements with partnership schools. Specific application procedures, screening, and selection criteria are in effect to limit course enrollments and acceptance to the M.A.T.

program. Please contact your childhood education program faculty adviser for details regarding the selective admission process. Admission requirements for the M.A.T. degree program for initial certification are as follows:

1. Completion of an appropriate undergraduate degree program.
2. Cumulative GPA of 3.00, or 3.00 in the last 60 hours of the baccalaureate degree .
3. Admission to the Graduate School.
4. Screening/acceptance into internship, which includes an admission portfolio.
5. Admission to the Master of Arts in Teaching program.
6. Successful completion of the required criminal background check. Background check materials must be submitted by May 1st prior to the internship year.
7. Completion of the pre-education core with a minimum of "C" in all courses.
8. Completion of all prerequisite courses in teaching field.
9. Payment of internship fee.

Requirements for the Master of Arts in Teaching Degree

A minimum of 33 hours of course work is required in one of the following concentrations.

Students should also be aware of Graduate School requirements with regard to master's degree.

Additional Requirements for the ESL Concentration:

CIED 5003	Elementary Education Seminar	3
CIED 5013	Measurement, Research and Statistical Concepts in the Schools	3
CIED 5022	Classroom Management Concepts	2
CIED 5032	Curriculum Design Concepts for Teachers	2
CIED 5053	Multicultural Issues in Elementary Education	3
CIED 5073	Action Research in Elementary Education	3
CIED 508V	Elementary Education Cohort Teaching Internship (taken in 2 enrollments of 3 hours each) ¹	6
CIED 5162	Applied Practicum	2
CIED 5173	Literacy Assessment and Intervention	3
CIED 5933	Second Language Methodologies	3
CIED 5953	Second Language Assessment	3
Total Hours		33

¹ 'B' or better required for graduation.

M.A.T. in Elementary Education with Gifted and Talented for K-6 Candidates Concentration

See also the general Graduate School requirements (p. 451) for the M.A.T. Degree.

Prerequisites to Degree Program

Enrollments will be limited in upper division professional studies courses in the Childhood Education B.S.E. Program. In addition, the number of students accepted into the M.A.T. Program in Elementary Education will be contingent upon availability of placements with partnership schools. Specific application procedures, screening, and selection criteria

are in effect to limit course enrollments and acceptance to the M.A.T. program. Please contact your childhood education program faculty adviser for details regarding the selective admission process. Admission requirements for the M.A.T. degree program for initial certification are as follows:

1. Completion of an appropriate undergraduate degree program.
2. Cumulative GPA of 3.00, or 3.00 in the last 60 hours of the baccalaureate degree .
3. Admission to the Graduate School.
4. Screening/acceptance into internship, which includes an admission portfolio.
5. Admission to the Master of Arts in Teaching program.
6. Successful completion of the required criminal background check. Background check materials must be submitted by May 1st prior to the internship year.
7. Completion of the pre-education core with a minimum of "C" in all courses.
8. Completion of all prerequisite courses in teaching field.
9. Payment of internship fee.

Requirements for the Master of Arts in Teaching Degree

A minimum of 33 hours of course work is required in one of the following concentrations.

Students should also be aware of Graduate School requirements with regard to master's degree.

Additional requirements for the Gifted and Talented Concentration:

CIED 5003	Elementary Education Seminar	3
CIED 5013	Measurement, Research and Statistical Concepts in the Schools	3
CIED 5022	Classroom Management Concepts	2
CIED 5032	Curriculum Design Concepts for Teachers	2
CIED 5053	Multicultural Issues in Elementary Education	3
CIED 5073	Action Research in Elementary Education	3
CIED 508V	Elementary Education Cohort Teaching Internship (taken in 2 enrollments of 3 hours each) ¹	6
CIED 5162	Applied Practicum	2
CIED 5173	Literacy Assessment and Intervention	3
Approved GT courses		6
Total Hours		33

¹ 'B' or better required for graduation.

M.A.T. in Elementary Education with Reading for K-6 Candidates Concentration

See also the general Graduate School requirements (p. 451) for the M.A.T. Degree.

Prerequisites to Degree Program

Enrollments will be limited in upper division professional studies courses in the Childhood Education B.S.E. Program. In addition, the number of students accepted into the M.A.T. Program in Elementary Education will be contingent upon availability of placements with partnership schools. Specific application procedures, screening, and selection criteria are in effect to limit course enrollments and acceptance to the M.A.T.

program. Please contact your childhood education program faculty adviser for details regarding the selective admission process. Admission requirements for the M.A.T. degree program for initial certification are as follows:

1. Completion of an appropriate undergraduate degree program.
2. Cumulative GPA of 3.00, or 3.00 in the last 60 hours of the baccalaureate degree .
3. Admission to the Graduate School.
4. Screening/acceptance into internship, which includes an admission portfolio.
5. Admission to the Master of Arts in Teaching program.
6. Successful completion of the required criminal background check. Background check materials must be submitted by May 1st prior to the internship year.
7. Completion of the pre-education core with a minimum of "C" in all courses.
8. Completion of all prerequisite courses in teaching field.
9. Payment of internship fee.

Requirements for the Master of Arts in Teaching Degree

A minimum of 33 hours of course work is required in one of the following concentrations.

Students should also be aware of Graduate School requirements with regard to master's degree.

Additional Requirements in Reading for K-6 Candidates Concentration

CIED 5003	Elementary Education Seminar	3
CIED 5013	Measurement, Research and Statistical Concepts in the Schools	3
CIED 5022	Classroom Management Concepts	2
CIED 5032	Curriculum Design Concepts for Teachers	2
CIED 5053	Multicultural Issues in Elementary Education	3
CIED 5073	Action Research in Elementary Education	3
CIED 508V	Elementary Education Cohort Teaching Internship (taken in 2 enrollments of 3 hours each) ¹	6
CIED 5162	Applied Practicum	2
SPED 5543	Dyslexia Teaching Practicum	3
SPED 5683	Teaching Literacy Skills to Students with Disabilities	3
SPED 5873	Assessment and Programming for Students with Disabilities	3
Total Hours		33

¹ 'B' or better required for graduation.

M.A.T. in Elementary Teaching with STEM for K-6 Candidates Concentration

See also the general Graduate School requirements (p. 451) for the M.A.T. Degree.

Prerequisites to Degree Program

Enrollments will be limited in upper division professional studies courses in the Childhood Education B.S.E. Program. In addition, the number of students accepted into the M.A.T. Program in Elementary Education

will be contingent upon availability of placements with partnership schools. Specific application procedures, screening, and selection criteria are in effect to limit course enrollments and acceptance to the M.A.T. program. Please contact your childhood education program faculty adviser for details regarding the selective admission process. Admission requirements for the M.A.T. degree program for initial certification are as follows:

1. Completion of an appropriate undergraduate degree program.
2. Cumulative GPA of 3.00, or 3.00 in the last 60 hours of the baccalaureate degree .
3. Admission to the Graduate School.
4. Screening/acceptance into internship, which includes an admission portfolio.
5. Admission to the Master of Arts in Teaching program.
6. Successful completion of the required criminal background check. Background check materials must be submitted by May 1st prior to the internship year.
7. Completion of the pre-education core with a minimum of "C" in all courses.
8. Completion of all prerequisite courses in teaching field.
9. Payment of internship fee.

Requirements for the Master of Arts in Teaching Degree

A minimum of 33 hours of course work is required in one of the following concentrations.

Students should also be aware of Graduate School requirements with regard to master's degree.

Additional Requirements in STEM for K-6 Concentration:

CIED 5003	Elementary Education Seminar	3
CIED 5013	Measurement, Research and Statistical Concepts in the Schools	3
CIED 5022	Classroom Management Concepts	2
CIED 5032	Curriculum Design Concepts for Teachers	2
CIED 5053	Multicultural Issues in Elementary Education	3
CIED 5073	Action Research in Elementary Education	3
CIED 508V	Elementary Education Cohort Teaching Internship (taken in 2 enrollments of 3 hours each) ¹	6
CIED 5162	Applied Practicum	2
CIED 5173	Literacy Assessment and Intervention	3
STEM 5203	Problem-Based Mathematics	3
STEM 5213	Teaching Problem-Based Science in the Elementary Grades	3
Total Hours		33

¹ 'B' or better required for graduation.

Engineering Management (EMGT)

Gregory S. Parnell
Program Director
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Engineering Management Website (<https://engineering-management.uark.edu/>)

Degree Offered:

M.S. in Engineering Management (EMGT)

The Master of Science in Engineering Management prepares engineers to lead and manage teams, projects, and organizations with technical workforces to meet strategic objectives. Students will increase their engineering and management knowledge to enable them to develop and deliver new products and services to create value for their organization and customers.

Mode of Delivery: Course work for the Master of Science in Engineering Management is delivered entirely online.

M.S. in Engineering Management

Admissions requirements:

1. Conferred bachelor of science in engineering degree from an engineering program accredited by the Engineering Accreditation Commission of ABET (or equivalent accreditation),
2. A grade point average (GPA) of 3.0 or better (A=4.0) on all course work taken prior to receipt of the engineering bachelor degree, or a GPA of 3.0 or better on the last 60 hours of course work taken prior to receipt of the engineering bachelor degree.
3. Applicants with a 3.0 or better GPA are not required to take the GRE.

Requirements for the Master of Science in Engineering Management:

Core Courses (12 hours)

EMGT 5033	Introduction to Engineering Management	3
INEG 5443	Decision Models	3
OMGT 5463	Economic Decision Making	3
OMGT 5783	Project Management for Operations Managers	3

Engineering Sequence

9

Three-course sequence from the following subject codes: BENG, BMEG, CHEG, CSCE, CVEG, ELEG, EMGT, INEG, or MEEG.

Students are encouraged to review the online engineering courses and select an approved cohesive sequence that meets their professional objectives.

Electives

9

Choose three courses from the available online EMGT, OMGT, engineering courses (listed above), or other approved graduate-level courses.

Suggested Electives:

OMGT 5793	Risk Management
OMGT 5003	Introduction to Operations Management
OMGT 5253	Leadership Principles and Practices
OMGT 5423	Operations Management & Global Competition
OMGT 5653	Introduction to Data Analytics for Operations Managers
OMGT 5983	Advanced Project Management
MGMT 5323	New Venture Development
MGMT 5363	Innovation & Creativity

Comprehensive Exam

A minimum of 80 percent of course work, including all core and engineering sequence courses, must be completed prior to the comprehensive oral exam.

Total Hours 30

Courses

EMGT 5033. Introduction to Engineering Management. 3 Hours.

Provides foundation knowledge of engineering management. Introduces quantitative skills required to lead a diverse, technical workforce, analyze financial data, lead technical projects, develop alternative solutions and communicate complex concepts. Apply decision and risk tools. Introduces basic engineering management principles. (Typically offered: Irregular)

EMGT 5053. Tradeoff Analytics for Engineering Management. 3 Hours.

Explore the use of trade-off analytics as a tool to assist with infrastructure development and preservation efforts, with integrated examples investigating maritime and multimodal infrastructure. Learn sound methodology to identify stakeholders, stakeholder objectives, and measures of performance for infrastructure improvement programs. Apply descriptive, predictive, and prescriptive data, models, and analytics to evaluate current infrastructure status and identify potential improvements. Develop and implement an Excel™ based decision support tool to provide trade-off analytics insights and assess best value-per-dollar infrastructure decisions. Prerequisite: EMGT 5033 or instructor consent or department consent. (Typically offered: Fall, Spring and Summer)

EMGT 514V. Special Topics in Engineering Management. 1-3 Hour.

Consideration of current engineering management topics not covered in other courses. May be repeated for up to 6 hours of degree credit. Prerequisite: Graduate standing and must be admitted to the Master of Science in Engineering Management Program, or the Project Management Graduate Certificate Program, or be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EMGT 5603. Systems Thinking and Systems Engineering. 3 Hours.

This course introduces systems thinking models for holistic framing of design decision opportunity, best practices for eliciting value schemes, crafting an objective hierarchy and measures, creative system level alternatives, modeling and simulation approaches to assess system level alternatives, and describe effectively synthesizing data so relationships can be effectively communicated and decisions made. (Typically offered: Fall, Spring and Summer)

EMGT 5703. Probability and Statistics for Engineering Management. 3 Hours.

This course introduces students to advanced quantitative techniques employed in the graphical and statistical interpretation and analysis of data, using appropriate statistical software tools. Students will learn how to implement effective descriptive techniques, how to use probability to characterize uncertainty, how to write and test statistically valid hypotheses, and how to use forecasting models to help solve engineering management problems. Applies engineering management specific case studies to support EMGT courses in an engineering management context. Applies non-parametric, advanced variable transformation for regression individually and in team environments to simulate engineering management tasks and work environment. Pre- or corequisite: Must be admitted to EMGT, OMGT (with department consent), MSE or department consent. (Typically offered: Fall, Spring and Summer)

Engineering, College of (ENGR)

Norman Dennis
Associate Dean
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College of Engineering Website (<https://engineering.uark.edu>)

Degrees Conferred:

M.S.E., Ph.D. (ENGR)

The College of Engineering offers instruction in engineering leading to the degrees of Master of Science in Biological, Biomedical, Chemical, Civil, Computer, Electrical, Environmental, Industrial, and Mechanical Engineering as well as a Master of Science in Operations Management and a Doctors of Philosophy in Engineering and Computer Science. Descriptions and requirements of these degree programs may be found under separate departmental headings. In addition, a Master of Science in Engineering (M.S.E.) degree is available for students who wish to take a broader range of courses than is usually permitted for the designated degrees listed above.

Master of Science in Engineering

General Requirements for the Master of Science Degrees in the College of Engineering: In addition to the requirements of the Graduate School, the following requirements have been established by the College of Engineering for all Master of Science graduates:

1. Complete a minimum of 30 semester hours of graduate-level credit beyond the bachelor's degree that includes 50 percent graduate-level credit in the field of study.
2. Earn a minimum cumulative grade-point average of 3.00 on all graduate courses attempted.

Departments may set higher grade standards and additional requirements.

Master of Science in Engineering Degree: The M.S.E. degree is available as a distance-delivered option. Courses are offered in five 8-week terms each year. A Master of Science in Engineering (M.S.E.) degree is available for students who wish to take a broader range of courses than is usually permitted for the designated degrees listed in the previous paragraph.

Prerequisites to the Master of Science in Engineering Degree:

Students with a B.S. degree from any engineering program accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology are normally accepted into the M.S.E. program.

Requirements for the Master of Science in Engineering Degree:

The general minimum requirements of the Graduate School for Master of Science degrees must be met. The graduate faculty of the College of Engineering has established the following specific requirements for the Master of Science in Engineering degree:

1. Complete a minimum of 30 semester hours of graduate-level credit beyond the bachelor's degree. Up to 6 semester hours of project research can be used to satisfy the required 30 semester hours of credit by writing a project paper approved by the departmental faculty.
2. Course requirements:
 - a. One 3-hour course from each of the following four areas for a total of 12 hours: mathematics, computer applications, technical communications, and engineering management;
 - b. Three 3-hour courses from a single engineering emphasis with the approval of the advisory committee;
 - c. Nine additional graduate-level hours from any area with the approval of the advisory committee, with:

- d. A maximum of four 4000-level graduate courses, with the remainder at the 5000 level or higher; and
 - e. A maximum of four Operations Management (OMGT) courses
3. Earn a minimum cumulative grade-point average of 3.00 on all graduate courses attempted. Minimum grades of "B" are required on 80 percent of the graduate hours taken for credit towards the M.S.E. degree.
 4. Satisfactorily complete a comprehensive examination.

The program of study for each candidate will be determined by conference with the major professor and with advice from the candidate's graduate committee.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Doctor of Philosophy in Engineering

General Requirements for the Doctor of Philosophy Degree in Engineering

The program of study leading to the degree of Doctor of Philosophy in Engineering will vary, depending upon the major field of study and the objective of the prospective candidate. Program requirements balance credit hours for required coursework, research, and dissertation preparation.

In addition to the requirements of the Graduate School and those established by the College of Engineering for all doctoral graduates, the following requirements have been established for INEG doctoral graduates:

1. A minimum of 72 semester hours of graduate-level credit beyond the bachelor's degree.
2. A minimum of 42 semester hours of graduate-level credit beyond the master's degree of which a minimum of 21 semester hours shall be approved graduate level courses and a minimum of 21 semester hours of dissertation hours (INEG 700V).
3. Students admitted with a B.S. degree must complete their initial 30 semester hours out of the 72 total at the 5000-level or above, with the remaining 42 semester hours subject to the rule stated in paragraph 2 above.
4. Ph.D. students in Industrial Engineering must pass a Qualifier Exam over a subset of topics in Industrial Engineering determined by the student's Doctoral Advisory Committee. Students may fail the exam once and retake it. Students who fail the exam twice will be dismissed from the Ph.D. program.

Departments may set higher grade standards and additional requirements. (See department requirements.) Students from non-engineering backgrounds typically will be required to take selected fundamental engineering courses.

Major areas of study for the Doctor of Philosophy Degree in Engineering are as follows:

- Biological Engineering
- Biomedical Engineering
- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering

- Industrial Engineering
- Mechanical Engineering

The Graduate School also offers a Doctor of Philosophy in Computer Science (p. 83).

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Courses

GNEG 5103. Globalization and Innovation. 3 Hours.

Integration of engineering in the globalized business environment. Innovation and integration models. Global survival skills. International organizational value-chain. Conducting business with emerging nations. Case studies; field trips; guest lectures. Experiential learning design component. Taken by students participating in departmental approved study abroad programs. (Typically offered: Irregular)

GNEG 550V. Master's Research Project. 1-3 Hour.

Required course for MSE students who wish to complete a Master's research project as part of their degree program. Prerequisite: Instructor permission. (Typically offered: Irregular)

GNEG 5801. Parallel Cooperative Education. 1 Hour.

Part time supervised experience in industry where students apply focused, discipline specific, classroom and research skills to problems directly related to their area of study in a professional work place setting. May be repeated for up to 3 hours of non-degree credit. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

GNEG 5811. Alternating Cooperative Education. 1 Hour.

Full time supervised experience in industry where students apply focused, discipline specific, classroom and research skills to problems directly related to their area of study in a professional work place setting. May be repeated for up to 3 hours of non-degree credit. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

GNEG 590V. Special Topics. 1-4 Hour.

Consideration of current engineering topics not covered in other courses. Prerequisite: Instructor's consent. (Typically offered: Irregular) May be repeated for up to 16 hours of degree credit.

English (ENGL)

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English Department Website (<https://fulbright.uark.edu/departments/english/>)

Degrees Conferred:

M.A., Ph.D. (ENGL)
M.F.A. in Creative Writing (CRWR)

Graduate Certificate Offered (non-degree):

Technical Writing and Public Rhetorics (TWRHGC)

Primary Areas of Faculty Research: English, American, and Anglophone literature; creative writing; poetics; literary translation; rhetoric and composition; literacy; linguistics; comparative literature; literary theory; service-learning; gender studies; peace and conflict studies; indigenous studies; southern studies; post-colonialism; science fiction; popular culture; American studies; African American studies; Latino/Latina studies; Central American literature; Muslim literature and culture, European studies; medieval Welsh; medieval and renaissance studies; digital humanities; sustainability and ecocriticism; folklore; music and literature; theatre; archival studies; politics and literature; religion and literature; psychoanalysis and literature; technology and literature; social media; film studies; the visual arts as text; professionalization in the humanities.

Areas of Study: Under each of the degree and certificate programs, the following areas of study are among those available:

- Master of Arts — generalist approach to history and criticism of literature in English; specialized approaches in the following areas: comparative literature; cultural studies; ethnic and regional literatures; gender and sexuality; medieval literature; Modern American literature; rhetoric, composition, and literacy.
- Master of Fine Arts — fiction, poetry, translation.
- Doctor of Philosophy — Medieval literature; Renaissance literature to 1660; nineteenth-century British literature; modern and contemporary British literature; American literature to 1900; modern and contemporary American literature; linguistics; literary criticism and theory; American southern literature and culture; world literature and culture in English; American multiculturalism; gender studies; film and media studies; popular culture and popular genres; literary history; rhetoric, composition, and literacy.
- Graduate Certificate in Technical Writing and Public Rhetorics — document design, writing for online audiences, technical editing, technical writing praxis and practice.

Admission to Degree Programs and Certificate Program: Detailed instructions for the application process are on the English Department website (<http://english.uark.edu/>). Each applicant must submit a separate application to the Graduate School and either the Director of Graduate Studies (for the M.A. and Ph.D. programs), the Director of Creative Writing (for the M.F.A. program), or the Director of Technical Writing and Public Rhetorics (for the Graduate Certificate program).

M.A. in English

Requirements for the Master of Arts in English Degree:

For further information about the Master of Arts Degree program, visit the 'M.A./Ph.D. in English' pages (<http://fulbright.uark.edu/departments/english/graduate/ma-phd-english/>) on the English Department website.

In addition to the general requirements of the Graduate School, the department stipulates that the following conditions be met:

1. Each candidate must complete a total of 30 credit hours.
2. Each candidate must take:
 - a. ENGL 5203 Introduction to Graduate Studies, one course emphasizing theory, and two courses at the seminar (6000) level
 - b. ENGL 5213 Portfolio Workshop (and successfully present a portfolio for the final project) or six thesis hours (and successfully defend a thesis for the final project)
3. Each candidate must also select either the Generalist Concentration or the Specialist Concentration and take the following courses:
 - a. Generalist Concentration (Portfolio Track)
 - i. Two courses selected from two of the following three areas: Medieval Literature and Culture; Renaissance Literature and Culture; Restoration and Eighteenth-Century British Literature and Culture
 - ii. Three courses selected from three of the following five areas (at least one course being in British literature and at least one course being in American literature): Nineteenth-Century British Literature and Culture; Modern and Contemporary British Literature and Culture; American Literature and Culture before 1900; Modern and Contemporary American Literature and Culture; World Literature and Culture in English
 - iii. Three elective courses offered by the Department of English or as approved by the student's graduate advisor
 - b. Generalist Concentration (Thesis Track)
 - i. Two courses selected from two of the following three areas: Medieval Literature and Culture; Renaissance Literature and Culture; Restoration and Eighteenth-Century British Literature and Culture
 - ii. Three courses selected from three of the following five areas (at least one course being in British literature and at least one course being in American literature): Nineteenth-Century British Literature and Culture; Modern and Contemporary British Literature and Culture; American Literature and Culture before 1900; Modern and Contemporary American Literature and Culture; World Literature and Culture in English
 - iii. Two elective courses offered by the Department of English or as approved by the student's graduate advisor
 - c. Specialist Concentration (Portfolio Track)
 - i. Five courses in one of the following areas of specialization: Comparative Literature; Cultural Studies; Environmental Literature, Writing, and Culture; Ethnic and Regional Literatures; Gender and Sexuality; Medieval Literature; Modern American Literature; Religion and Literature; Rhetoric, Composition, and Literacy
 - ii. Three elective courses offered by the Department of English or as approved by the student's graduate advisor
 - d. Specialist Concentration (Thesis Track)
 - i. Five courses in one of the following areas of specialization: Comparative Literature; Cultural Studies; Environmental Literature, Writing, and Culture; Ethnic and Regional Literatures; Gender and Sexuality; Medieval Literature; Modern American Literature; Religion and Literature; Rhetoric, Composition, and Literacy
 - ii. Two elective courses offered by the Department of English or as approved by the student's graduate advisor
4. Each candidate must demonstrate a reading knowledge of a language other than English that is relevant to the student's area of study. French, German, Italian, Spanish, Russian, Ancient Greek, and Latin are the normally acceptable choices, although other languages may be used with the approval of the Director of Graduate Studies. (For details about this requirement, see section 2, a-c, under "Requirements for the Doctor of Philosophy Degree (p. 130).#)
5. Each candidate must have a cumulative GPA of at least 3.33 for the total number of hours presented for the degree and may take a

maximum of one course at the 4000 level for credit with approval from the Director of Graduate Studies.

Graduate Student Appeal Process: Any M.A. student who is notified that he or she is being dismissed from the graduate program due to inadequate progress toward his or her degree has the right to appeal such a decision. The process for appealing is as follows:

1. The student may contact the Director of Graduate Studies to determine whether the student can take further steps to avoid being dismissed from the program.
2. If the Director of Graduate Studies advises the student that the student can take no further steps to remain in the program, the student may appeal this decision to the Department Chair.
3. If the Department Chair advises the student that the student can take no further steps to remain in the program, the student may appeal this decision to the Academic Appeals Committee of the Graduate Council through the graduate student academic grievance process.

If the Graduate Council advises the student that the student can take no further steps to remain in the program, the student will be dismissed from the program.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.F.A. in Creative Writing

Requirements for the Master of Fine Arts Degree in Creative Writing:

The program leading to the degree of Master of Fine Arts in Creative Writing provides graduate-level training in creative writing and in the study of literature.

Required Courses: 60 hours are required for the M.F.A. degree.

1. Required Writing and Craft Courses
 - a. Writing Workshop (15 to 24 semester hours)
 - b. Craft of Fiction, Poetry, or Translation (9 hours total: 6 hours in student's primary genre; 3 hours in second genre)
 - c. Modern/Contemporary Fiction and Poetry (9 hours total; 6 hours in student's primary genre; 3 hours in second genre)
2. Other Advanced Courses (4000-level or higher): 18-30 hours of literature or approved courses, at least 3 hours of which must be a course that focuses on literature written prior to 1900 and 3 hours of which must be a literature course that emphasizes cultural diversity.
3. Thesis Advising: 6 hours.

Thesis: An M.F.A. thesis may be a collection of poems or stories or a novel. For students whose primary genre is Translation, the thesis will consist of a significant body of work (i.e., poems, stories, or a novel) translated from the original language into English. The thesis should be of the quality of those works currently published by national magazines, by literary journals, and by legitimate book publishers.

Final Examination: Each M.F.A. candidate must pass a one-hour oral examination and defense of the thesis. Awarding of the M.F.A. degree requires approval of the faculty committee.

Grade Requirement: Per Graduate School policy, M.F.A. candidates must present a minimum cumulative grade-point average of 2.85 on all graduate courses required for the degree in order to earn the M.F.A. Failing to earn such an average on the minimum number of hours, the student is permitted to present up to six additional course (not thesis)

hours of graduate credit in order to accumulate a grade-point average of 2.85. In the computation of grade point, all courses pursued at this institution for graduate credit (including any repeated courses) shall be considered. Students who repeat a course in an endeavor to raise their grade must count the repetition toward the maximum of six additional hours. If a student encounters academic difficulty after having already completed six credit hours for the degree beyond the minimum degree requirements, no additional hours may be taken. Please note that the Graduate School calculates grade-point average on all graduate-level coursework displayed on the transcript.

All students working toward the degree will plan their specific programs in consultation with their advisers. All degree requirements must be completed within six consecutive calendar years from the date of first enrollment.

Find out more about the program at the Creative Writing website. (<http://mfa.uark.edu/>)

Focused Study in Rhetoric and Composition

Students earning the Master of Fine Arts in Creative Writing may choose Rhetoric and Composition as a field of focused study. Students who choose this option are required to do the following:

1. Take ENGL 5003 Composition Pedagogy; ENGL 5973 Advanced Studies in Rhetoric and Composition or ENGL 6973 Seminar in Rhetoric and Composition; and an additional graduate-level course in Rhetoric and Composition approved by the Director of Composition.
2. Teach five of the following writing courses offered by the English Department:
 - Any two courses from Category A
 - Any two courses from Category B
 - And any additional course from A, B or C

Category A
ENGL 0002, ENGL 0013, ENGL 1013, ENGL 1023, ENGL 1023 (Special Topics)

Category B
ENGL 2003, ENGL 1023, ENGL 1033, ENGL 3053

Category C
ENGL 2013, ENGL 2023, ENGL 3013
3. Earn 10 professional development points from the Program in Rhetoric and Composition by engaging in any combination of the following activities:
 - Presenting research at any Rhetoric and Composition conference (three points)
 - Organizing or leading a PRC workshop (two points)
 - Participating in a PRC workshop (one point)
 - Coordinating a PRC course or project (three points)

Ph.D. in English

For more information about the Doctor of Philosophy Degree program, visit the 'M.A./Ph.D. in English' pages (<http://fulbright.uark.edu/departments/english/graduate/ma-phd-english/>) on the English Department website.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the department stipulates that these requirements be met:

1. A student who begins doctoral study here may be required, at the discretion of the Director of Graduate Studies, to take certain designated deficiency courses in lieu of electives. However, these

hours will count toward the 24-hour course requirement for the doctoral degree.

2. Each doctoral candidate is required to demonstrate a reading knowledge of at least one language other than English that is relevant to the student's area of study. French, German, Italian, Spanish, Russian, Ancient Greek, and Latin are the normally acceptable choices to meet the foreign language requirement, although other languages may be used with the approval of the Director of Graduate Studies. Students who elect the medieval period as the field of specialization must demonstrate a reading knowledge of Latin, Old English, and Middle English as well as one relevant modern language. Doctoral candidates can meet the foreign language requirement by documenting that they have met a foreign language requirement at the University of Arkansas or another accredited M.A. program no more than two years before starting the Ph.D. program. This requirement should be met as early as possible in the student's program of study, preferably before registration for doctoral dissertation hours.

For either the M.A. or Ph.D. degree, reading knowledge must be demonstrated in one of the following ways:

- a. The student passes a test of reading knowledge as administered through the Department of World Languages, Literatures, and Cultures or by a member of the faculty of another department in the University who is competent to assess reading knowledge in the given language. The Department of World Languages, Literatures, and Cultures administers testing either in conjunction with Ph.D. reading courses (course number 3063) in French, German, Latin, or Spanish; or through individual examinations. Students wishing to be examined in a foreign language should contact the Department of World Languages, Literatures, and Cultures well before the test to familiarize themselves with the different requirements of each language program.
 - b. The student presents evidence of having completed the equivalent of one semester of graduate or upper-level undergraduate study in the given foreign language with a grade of "B" or above at an accredited college or university.
 - c. The student documents that the language in question is his or her native language and that he or she has native fluency in the language.
3. By the time they take the candidacy examinations, students must have completed the 24-hour course requirement or be registered for courses which, if passed, will complete the 24-hour course requirement. Students must pass both candidacy exams before registering for dissertation hours.
 4. To strengthen and support a field of specialization, each student may take up to six hours of graduate course work in other departments. Subject to the approval of the student's adviser, these hours will count toward the 24-hour course requirement for the degree.
 5. Students in the doctoral program are required to complete 24 semester hours of course work for graduate credit beyond the M.A. degree. This work must include at least one course in critical theory and at least four seminar courses, at least one of which must be in the field of specialization.
 6. With the consent of the Graduate Studies Committee, students will declare a field of specialization. This declaration will be made prior to the completion of the candidate's first year of doctoral studies; it must be made before arranging to take the written candidacy examination. The field of specialization may be a period (Medieval; Renaissance to 1660; Restoration and Eighteenth-Century British; Nineteenth-Century British; Modern and Contemporary British; American to 1900; Modern

and Contemporary American) or an area (Rhetoric, Composition, and Literacy; Southern Literature and Culture; World Literature and Culture in English; American Multiculturalism; Gender Studies; Film and Media Studies; Literary Criticism and Theory; Popular Culture and Popular Genres; and Literary History). In conjunction with their committee and with the approval of the Director of Graduate Studies, students may propose additional fields if their particular projects do not fit within any of the suggested areas.

7. The Director of Graduate Studies in the department must be notified by each student of his or her intention to take the candidacy examinations a month before the end of the term preceding the date of the examinations, which will be scheduled by the student in consultation with the committee administering the examinations. At the time of the candidacy examinations, each student must have a grade-point average of 3.50 for courses taken beyond the master's degree.
8. Each student must pass the following candidacy examinations:
 - a. A 72-hour take-home written examination in the field of specialization.
 - b. An oral examination on a specific topic within the student's broad field, approved jointly by the student and the exam committee. Students may retake only once any examination they fail.
9. Upon successfully completing the candidacy exams, if a dissertation prospectus has not already been submitted to the student's committee for approval, each student must submit a dissertation prospectus to be discussed and approved in a formal meeting with the student's dissertation committee.
10. Within the time limits specified by the Graduate School, each student must complete 18 dissertation hours and submit a dissertation acceptable to the student's dissertation committee.
11. Each student must pass a dissertation defense administered by the student's dissertation committee.

Graduate Student Appeal Process: Any Ph.D. student who is notified that he or she is being dismissed from the graduate program due to inadequate progress toward his or her degree has the right to appeal such a decision. The process for appealing is as follows:

1. The student may contact the Director of Graduate Studies to determine whether the student can take further steps to avoid being dismissed from the program.
2. If the Director of Graduate Studies advises the student that the student can take no further steps to remain in the program, the student may appeal this decision to the Department Chair.
3. If the Department Chair advises the student that the student can take no further steps to remain in the program, the student may appeal this decision to the Academic Appeals Committee of the Graduate Council through the graduate student academic grievance process.

If the Graduate Council advises the student that the student can take no further steps to remain in the program, the student will be dismissed from the program.

Focused Study in Rhetoric and Composition

Students earning the Doctor of Philosophy in English may choose Rhetoric and Composition as a field of focused study. Students who choose this option are required to do the following:

1. Take ENGL 5003 Composition Pedagogy; ENGL 5973 Advanced Studies in Rhetoric and Composition or ENGL 6973 Seminar in

Rhetoric and Composition; and an additional graduate-level course in Rhetoric and Composition approved by the Director of Composition.

2. Teach five of the following writing courses offered by the English Department:

- Any two courses from Category A
- Any two courses from Category B
- And any additional course from A, B or C

Category A

ENGL 0002, ENGL 0013, ENGL 1013, ENGL 1023, ENGL 1023 (Special Topics)

Category B

ENGL 2003, ENGL 1033, ENGL 3053

Category C

ENGL 2013, ENGL 2023, ENGL 3013

3. Earn 10 professional development points from the Program in Rhetoric and Composition by engaging in any combination of the following activities:

- Presenting research at any Rhetoric and Composition conference (three points)
- Organizing or leading a PRC workshop (two points)
- Participating in a PRC workshop (one point)
- Coordinating a PRC course or project (three points)

Graduate Certificate in Technical Writing and Public Rhetorics

Requirements: In order to complete the Graduate Certificate in Technical Writing and Public Rhetorics, students must complete 12 credit hours of coursework, with at least 6 of these hours coming from the Technical Writing and Public Rhetorics core curriculum. The additional 6 hours of credit may come from a list of approved elective courses or from additional courses from the core curriculum. Students must earn a grade of 'B' or better for all courses used to fulfill the requirements of the Graduate Certificate in Technical Writing and Public Rhetorics. In addition to coursework, students are required to complete a Technical Writing and Public Rhetorics Portfolio consisting of at least 4 pieces from the student's coursework in the program.

Core Curriculum		6-9
Minimum 6 hours required		
ENGL 5513	Document Design for Technical Writers	
ENGL 5523	Technical Writing for Online Audiences	
ENGL 5533	Technical Writing Praxis	
Elective Courses		3-6
Maximum of 6 hours allowed		
ENGL 5963	Advanced Studies in Technical Writing and Public Rhetorics	
ENGL 5973	Advanced Studies in Rhetoric and Composition	
ENGL 6973	Seminar in Rhetoric and Composition	

Other relevant graduate coursework will be allowed on a case-by-case basis, subject to administrative approval and topical relevancy to the graduate certificate and its aims.

Portfolio: Students must consult with the Director of the Graduate Certificate in Technical Writing and Public Rhetorics program during their final semester to develop and defend a portfolio. The program director will chair students' portfolio review committee; working with the director,

students will choose two additional faculty members to serve on the committee and at least four pieces of writing to include in the portfolio.

Students will work with the committee to polish those pieces to a level appropriate for publication or non-profit, government, or corporate use.

When the portfolio is approved by the committee, students will host a public viewing of their works, and the portfolio will be added to the certificate program's online repository of student work hosted by the university library.

Graduate Faculty

Bailey, Constance, Ph.D., M.A. (University of Missouri-Columbia), B.A. (Alcorn State University), Assistant Professor, 2016.

Booker, M. Keith, Ph.D. (University of Florida), M.S., M.A. (University of Tennessee), B.A. (Vanderbilt University), Professor, 1990.

Brock, Geoffrey Arthur, Ph.D. (University of Pennsylvania), M.F.A. (University of Florida), M.A. (University of Pennsylvania), B.A. (Florida State University), Distinguished Professor, 2005.

Burris, Sidney J., Ph.D., M.A. (University of Virginia), B.A. (Duke University), Professor, 1986.

Candido, Joseph D., Ph.D. (Indiana University at Bloomington), M.A. (University of New Hampshire), B.A. (Colby College), Professor, 1979.

Cochran, Robert Brady, Ph.D. (University of Toronto), M.A., B.S. (Northwestern University), Professor, 1976.

Davis, Geoffrey, Ph.D., M.F.A., M.A. (Penn State University), B.A. (Oregon State University), Associate Professor, 2014.

Dempsey, Sean A., Ph.D., M.A. (Boston University), B.A. (Connecticut College), Assistant Professor, 2009.

DuVal, John Tabb, Ph.D., M.F.A., M.A. (University of Arkansas), M.A. (University of Pennsylvania), A.B. (Franklin and Marshall College), Professor, 1982.

Hallett, LewEllyn, M.F.A. (Bowling Green State University), B.A. (University of New Mexico), Instructor, 2013.

Hinrichsen, Lisa, Ph.D., M.A. (Boston University), B.A. (Wellesley College), Associate Professor, 2008.

Hurt, Bryan M., Ph.D. (University of Southern California), B.A. (Ohio State University), Assistant Professor, 2019.

Jensen, Toni, Ph.D. (Texas Tech University), M.A., B.A. (University of South Dakota), Associate Professor, 2014.

Kahf, Mohja, Ph.D., B.A. (Rutgers State University-New Brunswick), Professor, 1995.

Kayser, Casey Lee, Ph.D. (Louisiana State University), M.A. (University of Missouri-Columbia), B.A. (Westminster College), Assistant Professor, 2012.

Long, Mary Beth, Ph.D., M.A. (University of Massachusetts, Amherst), B.A. (Ouachita Baptist University), Assistant Professor, 2014.

Madison, Karen, Ph.D., M.A., B.A. (University of Arkansas), Instructor, 2008.

Marren, Susan M., Ph.D., M.A. (University of Michigan-Ann Arbor), B.A. (Cornell University), Associate Professor, 1995.

McCombs, Davis, M.F.A. (University of Virginia), A.B. (Harvard), Professor, 2002.

Padilla, Yajaira, Ph.D. (University of California, San Diego), B.A. (University of California, Santa Cruz), Associate Professor, 2013.

Pope, Adam, Ph.D. (Purdue University), M.A. (University of Arkansas), B.A. (Freed-Hardeman University), Assistant Professor, 2013.

Quinn, William A., Ph.D., M.A. (The Ohio State University), B.A. (Xavier University), Distinguished Professor, 1979.

Raines, Anne, M.A., B.A. (University of Arkansas, Instructor, 2019.

Roberts, Robin, Ph.D., M.A. (University of Pennsylvania), B.A. (Mount Holyoke College), Professor, 2011.

Slattery, Patrick Joseph, Ph.D. (Indiana University at Bloomington), A.B. (College of the Holy Cross), Associate Professor, 1991.

Smith, Joshua Byron, Ph.D., M.A. (Northwestern University), B.A. (University of Illinois at Chicago), Associate Professor, 2011.

Sparks, Leigh Pryor, Ph.D. (University of Arkansas), M.A., B.A. (Stanford University), Teaching Assistant Professor, 2009.

Stephens, Dorothy Anne, Ph.D. (University of California-Berkeley), M.A. (University of Illinois-Chicago), B.A. (Northwestern University), Professor, 1992.

Szwydky-Davis, Lissette López, Ph.D., M.A. (Penn State University), B.A. (University of Miami), Associate Professor, 2013.

Teuton, Sean Kicummah, Ph.D., M.A. (Cornell University), B.A. (University of Colorado-Boulder), Professor, 2013.

Viswanathan, Padma, M.F.A. (University of Arizona), M.A. (Johns Hopkins University), B.A. (University of Alberta), Associate Professor, 2010.

Walsh, Lora, Ph.D. (Northwestern University), M.Sc. (University of Edinburgh), B.A. (Pepperdine University), Visiting Assistant Professor, 2014.

Yandell, Kay, Ph.D., M.A. (Cornell University), B.A. (University of Arkansas), Associate Professor, 2013.

English Courses

ENGL 5003. Composition Pedagogy. 3 Hours.

Introduction to teaching college composition. Designed for graduate assistants at the University of Arkansas. (Typically offered: Fall)

ENGL 5023. Writing Workshop: Fiction. 3 Hours.

Fiction writing workshop. Prerequisite: Creative Writing MFA students only. (Typically offered: Irregular) May be repeated for up to 24 hours of degree credit.

ENGL 5033. Writing Workshop: Poetry. 3 Hours.

Poetry writing workshop. Prerequisite: Creative Writing MFA students only. (Typically offered: Irregular) May be repeated for up to 24 hours of degree credit.

ENGL 5043. Translation Workshop. 3 Hours.

Problems of translation and the role of the translator as both scholar and creative writer; involves primarily the discussion in workshop of the translations of poetry, drama, and fiction done by the students, some emphasis upon comparative studies of existing translations of well-known works. Primary material will vary. Prerequisite: Reading knowledge of a foreign language and Creative Writing MFA students only. (Typically offered: Irregular) May be repeated for up to 24 hours of degree credit. This course is cross-listed with WLLC 504V.

ENGL 5063. English Language and Composition for Teachers. 3 Hours.

Subject matter and methods of approach for the teaching of composition in high school. (Typically offered: Fall and Spring)

ENGL 507V. Creative Non-Fiction Workshop. 1-3 Hour.

The theory and practice of the 'New Journalism' with a study of its antecedents and special attention to the use of 'fictional' techniques and narrator point of view to make more vivid the account of real people and real events. (Typically offered: Irregular)

ENGL 5083. Professional Topics. 3 Hours.

Specialized topics related to professional issues in the humanities, e.g. academic and alternative-academic job searches, publication workshops, public humanities, and/or teaching of humanities disciplines at various levels. (Typically offered: Irregular)

This course is cross-listed with HUMN 5083.

ENGL 5093. Research Methods in Rhetoric and Composition. 3 Hours.

Covers an array of research methods to support scholarly work in the fields of Rhetoric and Composition. Focus will vary depending on instructor interest. (Typically offered: Spring Even Years)

ENGL 510V. Readings in English and American Literature. 1-6 Hour.

Open to Honors candidates and graduate students. Prerequisite: Departmental approval and instructor approval required. (Typically offered: Irregular) May be repeated for degree credit.

ENGL 5173. Advanced Studies in Medieval Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5183. The Structure of Present English. 3 Hours.

Structural analysis of the language. (Typically offered: Spring)

ENGL 5193. Graduate Internship in English. 3 Hours.

Internship changes depending on availability and student interest. Departmental consent required. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENGL 5203. Introduction to Graduate Studies. 3 Hours.

Develop knowledge and strategies for successfully negotiating graduate work and the profession. Topics covered include, but are not limited to, scholarly habits and practices, writing and publishing skills, scholarly associations, journals, conferences, university structures, and career paths. Emphasis on the development of individual academic and professional goals. (Typically offered: Irregular)

ENGL 5213. Portfolio Workshop. 3 Hours.

Workshop designed for students in the M.A. Program in English who are using the Portfolio Option to complete the program. Instructor consent required. (Typically offered: Spring)

ENGL 5223. Advanced Studies in Renaissance Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5233. Craft of Translation: I. 3 Hours.

An examination of the principal challenges that confront translators of literature, including the recreation of style, dialect, ambiguities, and formal poetry; vertical translation; translation where multiple manuscripts exist; and the question of how literal a translation should be. (Typically offered: Irregular)

ENGL 5243. Special Topics. 3 Hours.

Designed to cover subject matter not offered in other courses. (Typically offered: Irregular) May be repeated for degree credit.

ENGL 5263. Craft of Fiction: I. 3 Hours.

Such aspects of the genre as scene, transition, character, and conflict. Discussion is limited to the novel. (Typically offered: Irregular)

ENGL 5273. Craft of Poetry: I. 3 Hours.

An examination of perception, diction, form, irony, resolution, and the critical theories of the major writers on poetry, such as Dryden, Coleridge, and Arnold. (Typically offered: Irregular)

ENGL 5283. Craft of Fiction: II. 3 Hours.

Second part of the study of the techniques of fiction. Discussion is limited to the short story. Prerequisite: ENGL 5263. (Typically offered: Irregular) May be repeated for degree credit.

ENGL 5293. Craft of Poetry: II. 3 Hours.

Second part of the study of the techniques of poetry; independent study of a poet or a problem in writing or criticism of poetry. (Typically offered: Irregular) May be repeated for up to 15 hours of degree credit.

ENGL 5313. Introduction to Literary Theory. 3 Hours.

An advanced introductory survey of a number of theoretical approaches to literature. (Typically offered: Irregular)

ENGL 5383. Histories of Rhetoric and Composition. 3 Hours.

Surveys contextualized histories of the field of Rhetoric and Composition. Focus and readings will vary depending on instructor interest. (Typically offered: Spring Even Years)

ENGL 5403. Advanced Studies in Nineteenth-Century British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5413. Advanced Studies in Modern and Contemporary British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5453. Technical Writing in Healthcare Settings. 3 Hours.

Focuses on the work of technical writing across a variety of healthcare settings. Prepares healthcare professionals and healthcare-adjacent professionals to use technical writing theory and skills in their workplace. (Typically offered: Summer)

ENGL 5463. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall) This course is cross-listed with WLLC 5463, ANTH 5473.

ENGL 5513. Document Design for Technical Writers. 3 Hours.

Focuses on the role of document design in technical and professional writing. Covers industry standard software and theories of rhetorically-centered document design. Special emphasis on creating print-ready technical documents such as manuals, catalogs, and infographics. (Typically offered: Fall Odd Years)

ENGL 5523. Technical Writing for Online Audiences. 3 Hours.

Investigates the medium-specific challenges of preparing technical documents for online audiences. Covers user-centered theory, strategies, and skills for online writing, HTML, CSS, and web standards. Specific focus on creating organizational websites with editorial workflows geared towards technical writers. (Typically offered: Fall Even Years)

ENGL 5533. Technical Writing Praxis. 3 Hours.

Focuses on the process of applying theory to situated practice in technical writing. The first portion of the course will lay out the fundamentals of technical writing theory, with the second half situating that theory within genre-specific practice. Second-half topics will vary by instructor interest and expertise. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

ENGL 5543. Advanced Studies in U.S. Latino/Latina Literature and Culture. 3 Hours.

The study of works of U.S. Latino/a literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5563. Advanced Studies in Native American Literature and Culture. 3 Hours.

The study of works of Native American literature, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5583. Advanced Studies in Arab American Literature and Culture. 3 Hours.

The study of works of Arab American literature and criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. Research paper required. No knowledge of Arabic necessary. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5593. Advanced Studies in Gender, Sexuality, and Literature. 3 Hours.

The study of gender or sexuality and literature, with attention to specific theories, themes, genres, authors, historical moments, literary movements, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5623. The Bible as Literature. 3 Hours.

The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms. (Typically offered: Irregular) This course is cross-listed with WLIT 5623.

ENGL 5653. Shakespeare: Plays and Poems. 3 Hours.

An introduction to a broad selection of Shakespeare's work. (Typically offered: Irregular)

ENGL 5703. Advanced Studies in American Literature and Culture Before 1900. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5723. Advanced Studies in Literature and Culture of the American South. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5763. Advanced Studies in Postcolonial Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5803. Advanced Studies in Modern and Contemporary American Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5863. Advanced Studies in African American Literature and Culture. 3 Hours.

The study of works of African American literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5923. Advanced Studies in Film and Media. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5933. Advanced Studies in Popular Culture and Popular Genres. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5943. Advanced Studies in Criticism and Literary Theory. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5953. Advanced Studies in Literary History. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5963. Advanced Studies in Technical Writing and Public Rhetorics. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. Course will cover various topics relevant to students working in Technical Writing and Public Rhetorics. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENGL 5973. Advanced Studies in Rhetoric and Composition. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6113. Seminar in Medieval Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6193. The Development of English. 3 Hours.

Intensive course in the fundamentals of linguistic study and their application to the history of English from prehistoric times to the present. (Typically offered: Fall)

ENGL 6203. Seminar in Renaissance Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6243. Seminar in Special Topics. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6443. Seminar in Nineteenth-Century British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6513. Seminar in Modern and Contemporary British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6543. Seminar in U.S. Latino/Latina Literature and Culture. 3 Hours.

The study of works of U.S. Latino/a literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6553. Seminar in Native American Literature and Culture. 3 Hours.

The study of works of Native American literature, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6583. Seminar in Arab American Literature and Culture. 3 Hours.

The study of works of Arab American literature and criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. Research paper required. No knowledge of Arabic necessary. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6593. Seminar in Gender, Sexuality, and Literature. 3 Hours.

The study of gender or sexuality and literature, with attention to specific theories, themes, genres, authors, historical moments, literary movements, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6723. Seminar in American Literature and Culture Before 1900. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6733. Seminar in Literature and Culture of the American South. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6763. Seminar in Postcolonial Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. At least one major research paper, suitable for presentation or publication, will be required.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6803. Seminar in Modern and Contemporary American Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6853. Seminar in African American Literature and Culture. 3 Hours.

The study of works of African American literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6923. Seminar in Film and Media. 3 Hours.

Extensive research into, and discussion of, a focused topic in film studies, with emphasis upon film as text. Extended project required. Course topic varies.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6933. Seminar in Popular Culture and Popular Genres. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6943. Seminar in Criticism and Literary Theory. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6973. Seminar in Rhetoric and Composition. 3 Hours.

Subject matter changes depending on student interest and faculty expertise.
(Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 698V. Master's Thesis. 1-6 Hour.

Master's thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENGL 699V. Master of Fine Arts Thesis. 1-6 Hour.

Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENGL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

World Literature Courses

WLIT 5123. Survey of Russian Literature from Its Beginning to the 1917 Revolution. 3 Hours.

(Formerly WLIT 4123.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English. Graduate degree credit will not be given for both WLIT 4123 and WLIT 5123.
(Typically offered: Irregular)

WLIT 5133. Survey of Russian Literature Since the 1917 Revolution. 3 Hours.

(Formerly WLIT 4133.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English with readings in English. Graduate degree credit will not be given for both WLIT 4133 and WLIT 5133. (Typically offered: Irregular)
This course is cross-listed with RUSS 5133.

WLIT 5193. Introduction to Comparative Literature. 3 Hours.

Literary theory, genres, movements, and influences. (Typically offered: Irregular)

WLIT 5443. Queer Theor(ies). 3 Hours.

Introduction to the complex history and evolution of Queer Theory into Queer Theor(ies) from Foucault to the Present. (Typically offered: Irregular)
This course is cross-listed with GNST 5443.

WLIT 5523. The Quran as Literature. 3 Hours.

The Quran as literary text: its style and form, historical context, translation, issues, communities of interpretation, and comparative perspectives. Course's integrated approach includes translations of literature originally in Arabic. All readings in English; students with reading abilities in Arabic encouraged to read original text.
(Typically offered: Irregular)

WLIT 5623. The Bible as Literature. 3 Hours.

The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms. (Typically offered: Irregular)
This course is cross-listed with ENGL 5623.

WLIT 575V. Special Investigations on World Literatures and Cultures. 1-6 Hour.

Independent study of a special topic in world literatures and cultures. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 5993. African Literature. 3 Hours.

(Formerly WLIT 4993.) A study of modern African fiction, drama, poetry, and film from various parts of Africa in their cultural context. Works are in English or English translation. Graduate credit will not be given for both WLIT 4993 and WLIT 5993. (Typically offered: Irregular)

WLIT 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

WLIT 603V. Special Studies in Comparative Literature. 1-6 Hour.

Special studies in comparative literature. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 6703. Psychoanalysis and Culture. 3 Hours.

Readings of key texts in Psychoanalytic thought and cultural criticism including Freud, Lacan, Kristeva, Certeau, Zizek, and others. Selections of Psychoanalytic approaches to literature, film and gender and trauma studies. (Typically offered: Irregular)

WLIT 6713. Literature of Spain, 711-1615 C.E.. 3 Hours.

Examines the multiple cultural traditions of Spain between 711-1615 C.E. and train to produce scholarship pertinent to the field. Integrated approach includes English translations of literature originally in Arabic (50%+ of content), Hebrew, Spanish, French. Students with reading abilities in original languages encouraged to read original text. (Typically offered: Irregular)

WLIT 6803. Postcolonial Theory and Subaltern Studies. 3 Hours.

Seminar examining the geopolitical (imperial, colonial and national) implications of knowledge and culture. Selected readings of early postcolonial texts by Cesaire, Fanon, and Fernandez Retamar, as well as more recent texts by Said, Spivak, Bhabha, Mignolo, Beverly and Chakrabarty among others. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 690V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Entomology (ENTO)

Kenneth Korth
Interim Department Head
217 Plant Sciences Building
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Ashley Dowling
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319 Agriculture Building
479-575-3404
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Department of Entomology Website (<http://entomology.uark.edu>)

Degrees Conferred:

M.S. in Entomology (ENTO)
Ph.D. in Agricultural, Food and Life Sciences (AFLS)

Primary Areas of Faculty Research: Pest management, insect pathology, insect-plant interactions, arthropod-animal interactions, biological control, molecular biology, taxonomy, systematics, physiology, and insect ecology.

M.S. in Entomology

Prerequisites to Degree Program: Applicants for graduate degrees must meet all requirements for admission to the Graduate School. Applicants without a master's degree will be accepted into the departmental program based on grade-point average (GPA), letters of recommendation, résumé and an adviser in the student's area of interest. Applicants must present Graduate Record Examination scores for the verbal, quantitative, and writing tests. To be accepted for the Master of Science degree, an undergraduate background in physical and biological sciences is essential. An undergraduate major in entomology is not required. A cumulative GPA of 3.00 is highly desirable.

Requirements for the Master of Science Degree: Students studying for the Master of Science degree with a limited undergraduate background in entomology may be expected to complete more than the minimum number of 30 credit hours required for the degree.

A thesis, reporting of original research, and a final comprehensive oral examination also are required.

Specific requirements follow:

General Course Requirements: The degree program and coursework for each candidate will be arranged on an individual basis. M.S. students must register for a minimum of 30 hours of graduate credit including 6 thesis hours.

Prerequisite Requirements: ENTO 3013. Introductory Entomology (Fa) or its equivalent. 3 hours.

Core Course Requirements: The student must take or have taken courses equivalent to:

ENTO 5024	Insect Diversity and Taxonomy	4
ENTO 5053	Insect Ecology	3
ENTO 5153	Insect Pest Management	3
ENTO 6113	Insect Physiology and Molecular Biology	3

A course in statistics for graduate credit is also required.

Seminar Requirements: Two semester hours of seminar are required. Seminar hours may be taken in Entomology (ENTO 6071) or, with Department Head approval, as a formal for-credit seminar offered in another department within the university. In addition, each student is required to present a seminar on his/her thesis research plans during the first year of the degree program and an exit seminar on the thesis research prior to leaving the program.

Residence Requirements: A minimum of 30 weeks in residence is required for the M.S. degree.

Grade Point Average Requirement: A minimum 3.00 GPA must be maintained. If the cumulative GPA falls below 3.00, or research or general

academic progress is unsatisfactory, the student's performance will be re-evaluated by the Advisory Committee and a recommendation made on continued status as a graduate student. For details about this process, please see the Graduate Student Handbook on the departmental website.

Comprehensive Examination: A comprehensive oral examination covering coursework and defense of the thesis research is required. The examination is generally taken during the student's final semester.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Ph.D. in AFLS with Entomology Concentration

Prerequisites to Degree Program: A Master of Science degree is desirable. A student with a Bachelor of Science and an exceptional record in academics and/or research may be approved for admission to the Ph.D. program in Agricultural, Food and Life Sciences if the Graduate Student Concentration Admissions Committee of the desired concentration deems them qualified and approval is granted by the AFLSPH Steering Committee. A student admitted to the University of Arkansas, pursuing an M.S. and in good academic standing may apply to be admitted to the doctoral program and forgo completing the M.S. degree if so approved by the AFLSPH Steering Committee and the AFLSPH Graduate Concentration Admissions Committee. A minimum grade point average of 3.00 (on a 4.00 scale) on previous college-level course work is required.

Admission Requirements for Entry: To be considered for admission, a student must submit a letter of intent, along with the application for admission indicating the desired degree concentration, areas of interest and career goals. Official transcripts of all previous college-level course work must be submitted. Three letters of recommendation are required. These letters should address the character and academic capability of the applicant. Applications will first be reviewed by the AFLSPH Steering Committee which will assign the student to the appropriate Graduate Student Concentration Admissions Committee for review. The Concentration Admissions Committee will make the final determination of admittance into the AFLSPH program and the concentration.

Requirements for Doctor of Philosophy Degree: The Ph.D. program in Agricultural, Food and Life Sciences requires a minimum of 72 credit hours after a Bachelor of Science or Bachelor of Arts degree or a minimum of 42 hours after a Master of Science or Master of Arts degree.

General course requirements for each degree candidate are arranged on an individual basis by the Faculty Adviser, the Graduate Advisory Committee and the candidate in accordance with guidelines of their concentration. Alternate courses may be selected at the discretion of the committee.

All students must complete 6 hours of elective course hours and 2 hours of seminar. One seminar must be a research proposal presentation and the other must be an exit seminar presenting the dissertation research results. All students must complete 18 hours of doctoral dissertation hours. Students entering the doctoral program with only a B.S. or B.A. must also complete an additional 30 hours (to reach the 72 hour post B.S./B.A. requirement). Students must satisfactorily pass written and oral candidacy examinations covering their discipline and supporting areas. These examinations must be completed at least one year before completion of the Ph.D. degree program in Agricultural, Food and Life Sciences. Each candidate must complete a doctoral dissertation on an important research topic in the concentration field. The specific

problem and subject of the dissertation is determined by the faculty adviser, the student and the Graduate Advisory Committee. A dissertation title must be submitted to the dean of the Graduate School at least one year before the dissertation defense. Provisional approval of the dissertation must be given by all members of the Graduate Advisory Committee prior to the dissertation defense. Students must pass the oral defense and examination of the dissertation given by the Graduate Advisory Committee. A student cannot be approved for conferral of the doctoral degree until after completion of all coursework, written and oral candidacy exams, the defense passed and dissertation accepted by the Graduate School and an application for the degree has been filed with the Registrar's Office and the fee paid.

Additional Requirements for Entomology Concentration

In addition to the general requirements for the Ph.D. program in Agricultural, Food and Life Sciences, students in the Entomology concentration must complete:

ENTO 5024	Insect Diversity and Taxonomy	4
ENTO 5053	Insect Ecology	3
ENTO 5153	Insect Pest Management	3
ENTO 6113	Insect Physiology and Molecular Biology	3
AGST 5014	Experimental Design	4

Graduate Faculty

Bateman, Nick, Ph.D. (Mississippi State University), B.S. (University of Arkansas-Monticello), Assistant Professor, 2016.

Bluhm, Burt H., Ph.D., M.S. (Purdue University), B.S. (University of Oklahoma), Associate Professor, 2008.

Correll, Jim, Ph.D., M.S. (University of California-Berkeley), B.S. (Pennsylvania State University), Distinguished Professor, 1989.

Dowling, Ashley Patrick Gregg, Ph.D. (University of Michigan-Ann Arbor), B.S. (University of Arizona), Professor, 2008.

Egan, Martin J., Ph.D., B.Sc. (University of Exeter, United Kingdom), Assistant Professor, 2016.

Faske, Travis, Ph.D. (Texas A&M University), M.S. (Oklahoma State University), B.S. (Tarleton State University), Associate Professor, 2015.

Goggins, Fiona, Ph.D. (University of California-Davis), B.S. (Cornell University), Professor, 2001.

Joshi, Neelendra, Ph.D. (Pennsylvania State University), Assistant Professor, 2015.

Korth, Ken L., Ph.D. (North Carolina State University), B.S. (University of Nebraska), Professor, 1999.

Loftin, Kelly M., Ph.D. (New Mexico State University), M.S. (University of Arkansas), B.S. (Arkansas Tech), Associate Professor, 2002.

Lorenz, Gus M., Ph.D., B.S.A., M.S. (University of Arkansas), Distinguished Professor, 1997.

Rojas, Alejandro, Ph.D., M.S. (Michigan State University), M.S., B.S. (Los Andes University), Assistant Professor, 2018.

Rojas, Clemencia, Ph.D. (Cornell University), M.S. (Purdue University), B.S. (Universidad de Los Andes, Colombia), Assistant Professor, 2015.

Rupe, John C., Ph.D., M.S. (University of Kentucky), B.S. (Colorado State University), University Professor, 1984.

Spradley, J. Ples, M.S. (University of Arkansas), B.S. (Hendrix College), Extension Associate Professor, 1984.

Spurlock, Terry, Ph.D. (University of Arkansas), Extension Associate Professor, 2015.

Steinkraus, Donald C., Ph.D. (Cornell University), M.S. (University of Connecticut), B.A. (Cornell University), Professor, 1989.

Studebaker, Glenn, Ph.D., M.S. (University of Arkansas), B.S. (Missouri Southern State University), Associate Professor, 1993.

Szalanski, Allen Lawrence, Ph.D. (University of Nebraska-Lincoln), M.S. (Kansas State University), B.S. (University of Manitoba), Professor, 2001.

Thrash, Ben, Assistant Professor, 2018.

Tzanetakakis, Ioannis E., Ph.D. (Oregon State University), M.S., B.S. (Agricultural University of Athens, Greece), Professor, 2008.

Wamishe, Yeshe Andenow, Ph.D. (University of Arkansas) M.S., B.S. (Addis Ababa University, Ethiopia), Associate Professor, 2011.

Courses

ENTO 500V. Special Problems. 1-4 Hour.

Special problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

ENTO 5013. Morphology of Insects. 3 Hours.

Origin, evolution, and functional significance of external insect structure. Structure and function of major internal systems. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Lab component. (Typically offered: Fall Odd Years)

ENTO 5024. Insect Diversity and Taxonomy. 4 Hours.

Principles and practices of insect classification and identification with emphasis on adult insects. 2.5 hours lecture, 4 hours lab. Prerequisite: ENTO 3013 or instructor consent. Corequisite: Lab component. (Typically offered: Fall)

This course is cross-listed with BIOL 5024.

ENTO 5043. Apiculture. 3 Hours.

To acquaint the student with social insects in general and honey bees in particular, to promote an interest in apiculture as a hobby, occupation, and/or science, to give the students the basic knowledge of how to keep honey bees, and to increase awareness of the contribution that pollinating insects make to agriculture, natural ecosystems, and human life. Corequisite: Lab component. Prerequisite: Instructor consent. (Typically offered: Spring Odd Years)

ENTO 5053. Insect Ecology. 3 Hours.

To develop an understanding of important ecological concepts through study of dynamic relationships among insects and their environment. To become familiar with the literature of insect ecology, and interpretation and critique of ecological research. Previous knowledge of basic entomology and/or ecology will be assumed. 2 hours lecture/2 hours lab. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Fall Even Years)

This course is cross-listed with BIOL 5053.

ENTO 510V. Special Topics. 1-3 Hour.

Topics not covered in other courses or a more intensive study of specific topics in entomology. (Typically offered: Irregular) May be repeated for degree credit.

ENTO 5113. Insect Behavior and Chemical Ecology. 3 Hours.

Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Spring Even Years)

This course is cross-listed with BIOL 5113.

ENTO 5123. Biological Control. 3 Hours.

Theoretical and practical basis for biological control of arthropod pests and weeds via parasites, predators, and pathogens. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. (Typically offered: Fall Odd Years)

ENTO 5133. Insect Molecular Genetics. 3 Hours.

A hands on course in insect molecular genetic techniques including molecular diagnostics and population genetics. Students will learn how to apply advanced molecular genetic methodologies and Internet database resources to insects that they are using for their graduate research. (Typically offered: Spring Even Years)

This course is cross-listed with BIOL 5133.

ENTO 5153. Insect Pest Management. 3 Hours.

Study of principles and concept of insect pest management. Areas covered include a survey of arthropod pests and damage, population dynamics, damage thresholds, physiological units, prediction models, surveillance, arthropod sampling, strategies and tactics utilized to maintain pest populations below economic injury levels.

Prerequisite: Instructor consent. (Typically offered: Spring Odd Years)

ENTO 5163. Advanced Applied Entomology. 3 Hours.

Topics will include the integration of tactics, integration of disciplines and specific case histories in insect management, or use of insects to manage weeds.

Prerequisite: Instructor consent. (Typically offered: Spring Even Years)

ENTO 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENTO 6071. Seminar. 1 Hour.

Fall: special topics not covered in regular course work. Spring: critical review of research papers in entomology. Seminar will be taken by graduate student majors for both semesters. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ENTO 6113. Insect Physiology and Molecular Biology. 3 Hours.

Overview of insect physiology and modern molecular techniques to study physiological processes. Previous knowledge of basic entomology is helpful, but not required. Two lectures per week (1 hour 20 minutes each). (Typically offered: Spring Even Years)

This course is cross-listed with BIOL 6113.

ENTO 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Environmental Dynamics (ENDY)

Peter Ungar
Program Director
336 Old Main
479-575-6603
Email: endy@uark.edu

Environmental Dynamics Website

Degree Conferred:

M.S. in Environmental Dynamics (ENDY)
Ph.D. in Environmental Dynamics (ENDY)

Program Description: The Environmental Dynamics faculty prepare program graduates to enter the workforce as leaders in the global effort to understand and manage climate change and human responses to it. Environmental Dynamics students can learn from nearly 100 affiliated faculty members and make use of state-of-the-art research facilities and laboratories on our campus. Our approach is interdisciplinary and allows students to work across departments and colleges to gain the tools needed to address today's most pressing environmental issues. The Environmental Dynamics program's focus is unique and two-tiered, providing students with a deep-time perspective, which gives human-environmental interactions context, and sustainability, which gives them relevance. This approach benefits all Environmental Dynamics students and prepares them to meet the challenges of employment that master's and doctoral degree-holding professionals face in today's world.

Primary Areas of Faculty Research: Interdisciplinary research activities among faculty participating in the ENDY program are very broad, though particular areas of strength are found in dendrochronology and paleoclimatology; watershed and water resource sciences; geosciences

(geomorphology, geodynamics, geodesy, geoinformatics and geospatial applications); anthropology; soil sciences; sustainability issues; ecology, ecological change, environmental pollution and land use change; and impacts of natural hazards. In addition, many research activities involve strong components of social sciences, economics and sustainable development. Interested individuals are encouraged to contact the ENDY program or participating faculty to obtain additional information related to specific research projects and possible participation.

Requirements for M.S. in Environmental Dynamics

Admission: The candidate for admission to graduate study in Environmental Dynamics must satisfy the requirements of the Graduate School and have the approval of the Administrative Board. The student must have a B.A. or B.S. in a related field and submit the following information:

1. Three recommendations from individuals familiar with the applicant's academic or work history who can give candid assessments of the applicant's ability to perform at the graduate level.
2. A Statement of Purpose outlining the applicant's plans for the ENDY degree program that includes relevance of previous academic or work experience, current research interests or employment that bear on graduate level research, special skills, fieldwork. experience, familiarity with interdisciplinary work (if any), and future career goals.
3. An example of the applicant's writing such as a publication reprint, report, major term paper, undergraduate honors thesis, or similar document that demonstrates the applicant's organizational skills, research ability, familiarity with a body of literature, ability to report clearly on an academic topic, and/or general writing skills.
4. English language requirements of the Graduate School.
5. GRE scores
6. Other relevant information that would assist the Admissions Committee in selecting applicants to the program.

The program of study is designed primarily for the student who seeks the Ph.D. degree. However, those interested in a terminal master's degree will be considered for admission on a case-by-case basis. All Ph.D. candidates entering with a B.A./B.S. must complete requirements for the M.S. degree.

Requirements for the Master of Science Degree: Students who seek only the Master of Science Degree must complete 24 hours of coursework which include the following four required courses:

ENDY 6013	Environmental Dynamics	3
ENDY 5053	Quaternary Environments	3
ENDY 5113	Global Change	3
ENDY 6033	Society and Environment	3

In addition, student must complete 6 hours of ENDY 600V (Thesis hours) and submit a research thesis or take a total of 36 hours for a non-thesis M.S.

Ph.D. in Environmental Dynamics

Requirements for Admission: Applicants should hold a bachelor's or master's degree in a discipline with an environmental focus, such as anthropology; geography; geology; biological sciences; crop, soil and environmental sciences; environmental engineering; environmental economics, policy, or sociology. Further, these students will be required to have at least a 3.0 GPA and strong scores on all components of the

Graduate Record Examination (GRE). Admission into the program will be by committee evaluation. In addition to fulfilling the requirements for admission to the Graduate School, applicants must also supply the following materials:

1. Three recommendations from individuals familiar with the applicant's academic or work history who can give candid assessments of the applicant's ability to perform at the Ph.D. level.
2. A Statement of Purpose outlining the applicant's plans for the Environmental Dynamics degree program that includes relevance of previous academic or work experience, current research interests or employment that bear on doctoral research, special skills, fieldwork experience, familiarity with interdisciplinary work (if any), and future career goals.
3. An example of the applicant's writing such as a publication reprint, report, major term paper, undergraduate honors thesis, chapter from M.A./M.S. thesis, or similar document that demonstrates the applicant's organizational skills, research ability, familiarity with a body of literature, ability to report clearly on an academic topic, and/or general writing skills.
4. English language requirements of the Graduate School.
5. GRE scores.
6. Other relevant information that would assist the Admissions Committee in selecting applicants to the program.

Requirements for the Degree: During the first semester of study, all students will be assigned an advisory committee to determine the student's particular program plan. Students are required to integrate both environmental and human components into their Ph.D. coursework and dissertation research. The advisory committee will determine the courses required and assist the student in balancing courses among disciplines.

Students become candidates for the doctorate only upon passing written and oral comprehensive exams. The examination must be passed at least nine months before graduation. If necessary comprehensive exams may be taken a second time at the discretion of the Comprehensive Exam Committee.

Each candidate must complete a doctoral dissertation on a topic determined through collaboration with a major professor and dissertation committee. This dissertation must be a scholarly and significant original contribution to knowledge within the field of Environmental Dynamics.

A final oral examination is required and must be taken at least two weeks before graduation. The examination will be concerned primarily with the candidate's dissertation but may include other aspects of the graduate work.

Individually tailored programs of study will be designed with the expectation that the student will complete requirements for the master's degree in Environmental Dynamics during the course of study (or enter the Ph.D. Program with an M.A. or M.S. degree in a related field in hand), and a minimum of 24 hours of course work beyond the master's level, to include four required courses if they haven't already been taken as part of their M.S. study:

ENDY/GEOS 5113	Global Change	3
ENDY 6013	Environmental Dynamics	3
ENDY/ANTH/GEOS 5053	Quaternary Environments	3

ENDY/ANTH Society and Environment 3
6033

In addition, students are required to take three semesters of ENDY 6991 Environmental Dynamics Colloquium if they haven't already been taken as part of their M.S. study, and 18 hours of dissertation research are required.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

A

Aly, Mohamed H., Ph.D. (Texas A&M), M.S., B.S. (Zagazig University), Assistant Professor, Department of Geosciences, 2013.

Arnold, Mark E., Ph.D., B.S. (Northern Illinois University), A.S. (Rock Valley College), Associate Professor, Department of Mathematical Sciences, 1993.

B

Beaupre, Steven J., Ph.D. (University of Pennsylvania), M.S., B.S. (University of Wisconsin), Professor, Department of Biological Sciences, 1995.

Boss, Steve K., Ph.D. (University of North Carolina at Chapel Hill), M.S. (Utah State University), B.S. (Bemidji State University), Professor, Department of Geosciences, 1996.

Brye, Kristofor R., Ph.D., M.S. (University of Wisconsin-Madison), B.S. (University of Wisconsin-Stevens Point), University Professor, Department of Crop, Soil and Environmental Sciences, 2001.

C

Coffey, Ken, Ph.D. (University of Missouri-Columbia), M.S. (University of Kentucky), B.S. (University of Tennessee), Professor, Department of Animal Science, 1996.

Cothren, Jackson David, Ph.D., M.S. (The Ohio State University), B.S. (United States Air Force Academy), Associate Professor, Department of Geosciences, 2004.

Covington, Matthew D., Ph.D. (University of California-Santa Cruz), B.A. (University of Arkansas), Associate Professor, Department of Geosciences, 2012.

D

Davidson, Fiona M., Ph.D., M.A. (University of Nebraska-Lincoln), B.A. (Newcastle Upon Tyne Polytechnic), Associate Professor, Department of Geosciences, 1992.

Davis, Ralph K., Ph.D., M.S., B.S. (University of Nebraska, Lincoln), Professor, Department of Geosciences, 1994.

Dixon, Bruce Lawrence, Ph.D., M.S. (University of California-Davis), B.A. (University of California-Santa Barbara), Professor, Department of Agricultural Economics and Agribusiness, 1984.

Dumond, Gregory, Ph.D. (University of Massachusetts), M.S. (Texas Tech University), B.S. (University of Texas El Paso), Associate Professor, Department of Geosciences, 2010.

F

Feng, Song, Ph.D., M.S. (Chinese Academy of Sciences), B.S. (Yunnan University), Associate Professor, Department of Geosciences, 2013.

Fitzpatrick, Kevin M., Ph.D. (State University of New York at Albany), M.A. (University of South Carolina at Columbia), B.A. (Susquehanna University), University Professor, Department of Sociology and Criminology, 2005.

G

Gordon, Joel Samuel, Ph.D. (University of Michigan-Ann Arbor), B.A. (University of Illinois), Professor, Department of History, 1999.

H

Haggard, Brian Edward, Ph.D. (Oklahoma State University), M.S. (University of Arkansas), B.S. (Missouri University of Science and Technology), Professor, Department of Biological and Agricultural Engineering, 2006.

Hays, Phillip D., Ph.D., M.S. (Texas A&M University), B.S. (University of Arkansas), Research Professor, Department of Geosciences, 2000.

K

Kay, Marvin, Ph.D. (University of Colorado-Boulder), M.A., B.A. (University of Missouri-Columbia), Professor, Department of Anthropology, 1980.

Kvamme, Kenneth L., Ph.D. (University of California-Santa Barbara), M.A., B.A. (Colorado State University), Professor, Department of Anthropology, 1999.

L

Limp, Fred, Ph.D., M.A., B.A. (Indiana University at Bloomington), University Professor, Department of Geosciences, 1979.

Liner, Christopher L., Ph.D. (Colorado School of Mines), M.S. (University of Tulsa), B.S. (University of Arkansas), Professor, Department of Geosciences, 2012.

M

Matlock, Marty D., Ph.D., M.S., B.S. (Oklahoma State University), Professor, Department of Biological and Agricultural Engineering, 2001.

McComas, William, Ph.D. (University of Iowa), M.S. (West Chester University of Pennsylvania), B.S. (Lock Haven University of Pennsylvania), Distinguished Professor, Department of Curriculum and Instruction, 2006.

Messadi, Tahar, Ed.D., M.Arch. (University of Michigan-Ann Arbor), B.Arch. (Universite de Constantine, Algeria), Associate Professor, Department of Architecture, 2003.

Miller, David M., Ph.D. (University of Georgia), M.S., B.S. (Purdue University), Professor, Department of Crop, Soil and Environmental Sciences, 1988.

N

Nalley, Lawton Lanier, Ph.D. (Kansas State University), M.S. (Mississippi State University), B.S. (The Ohio State University), Professor, Department of Agricultural Economics and Agribusiness, 2008.

Nolan, Justin Murphy, Ph.D., M.A. (University of Missouri-Columbia), B.A. (Westminster College), Associate Professor, Department of Anthropology, 2002.

P

Paradise, Thomas R., Ph.D. (Arizona State University), M.A. (Georgia State University), F.G.A., G.G. (Gemological Institute of America), B.S. (University of Nevada), University Professor, Department of Geosciences, 2000.

Petris, Giovanni, Ph.D., M.S. (Duke University), B.S. (Universita degli Studi di Milano, Italy), Professor, Department of Mathematical Sciences, 1999.

Plavcan, Joseph M., Ph.D., B.A. (Duke University), Professor, Department of Anthropology, 2001.

Popp, Jennie Sheerin, Ph.D., M.S. (Colorado State University), B.S. (University of Scranton), Professor, Department of Agricultural Economics and Agribusiness, 1998.

Popp, Michael P., Ph.D. (Colorado State University), M.B.A. (University of Colorado-Boulder), B.Comm. (University of Manitoba), Professor, Department of Agricultural Economics and Agribusiness, 1998.

Potra, Adriana, Ph.D. (Florida International University), M.S., B.S. (University of Babes-Bolyai, Romania), Associate Professor, Department of Geosciences, 2012.

R

Rom, Curt R., Ph.D., M.S. (The Ohio State University), B.S. (University of Arkansas), University Professor, Department of Horticulture, 1989.

Rose, Jerry, Ph.D., M.A. (University of Massachusetts), B.A. (University of Colorado), University Professor, Department of Anthropology, 1976.

S

Savin, Mary Cathleen, Ph.D., M.S. (University of Rhode Island), B.S. (University of Notre Dame), Professor, Department of Crop, Soil and Environmental Sciences, 2002.

Schwab, Bill, Ph.D., M.A. (The Ohio State University), M.A. (University of Akron), B.A. (Miami University), University Professor, Department of Sociology and Criminology, 1976.

Smith, Carl Alan, Ph.D., M.A. (University of Sheffield), B.Sc. (University of Lancaster), Associate Professor, Department of Landscape Architecture, 2008.

Spiegel, Frederick W., Ph.D. (University of North Carolina at Chapel Hill), B.A. (Drew University), Distinguished Professor, Department of Biological Sciences, 1982.

Stahle, David William, Ph.D. (Arizona State University), M.A. (University of Arkansas), B.A. (University of Arizona), Distinguished Professor, Department of Geosciences, 1982.

Stephenson, Steven Lee, Ph.D., M.S. (Virginia Polytechnic Institute and State University), B.S. (Lynchburg College), Research Professor, Department of Biological Sciences, 2003.

Suarez, Celina A., Ph.D. (University of Kansas), M.S. (Temple University), B.S. (Trinity University), Associate Professor, Department of Geosciences, 2012.

Swedenburg, Ted R., Ph.D., M.A., (University of Texas at Austin), B.A. (University of Beirut), Professor, Department of Anthropology, 1996.

T

Thoma, Greg, Ph.D. (Louisiana State University), M.S.Ch.E., B.S.Ch.E. (University of Arkansas), Professor, Ralph E. Martin Department of Chemical Engineering, 1993.

Tullis, Jason A., Ph.D., M.S. (University of South Carolina at Columbia), B.S. (Brigham Young University), Professor, Department of Geosciences, 2004.

U

Ungar, Peter S., Ph.D., M.A. (State University of New York at Stony Brook), B.A. (State University of New York, Binghamton), Distinguished Professor, Department of Anthropology, 1995.

W

West, Elliott, Ph.D., M.A. (University of Colorado-Boulder), B.A. (University of Texas, Austin), Alumni Distinguished Professor, Department of History, 1979.

Whayne, Jeannie, Ph.D., M.A., B.A. (University of California-San Diego), University Professor, Department of History, 1990.

Courses

ENDY 5043. GIS Analysis and Modeling. 3 Hours.

Unlike conventional GIS courses that focus on studying 'where', this course will teach students to address beyond 'where' using various GIS analysis and modeling techniques to explore 'why' and 'how'. The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. (Typically offered: Spring)

This course is cross-listed with GEOS 5653, ANTH 5653.

ENDY 5053. Quaternary Environments. 3 Hours.

An interdisciplinary study of the Quaternary Period including dating methods, deposits soils, climates, tectonics and human adaptations. (Typically offered: Fall)

This course is cross-listed with ANTH 5053, GEOS 5053.

ENDY 5113. Global Change. 3 Hours.

Examines the interacting natural and anthropogenic factors involved in global change, concentrating on climate variability and change. Prerequisite: Graduate standing or instructor's approval. (Typically offered: Spring)

This course is cross-listed with GEOS 5113.

ENDY 5153. Environmental Site Assessment. 3 Hours.

Principles, problems, and methods related to conducting an environmental site assessment. An applied course covering field site assessment, regulatory documentation, and report preparation. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Irregular)

This course is cross-listed with GEOS 5153.

ENDY 5853. Environmental Isotope Geochemistry. 3 Hours.

Introduction to principles of isotope fractionation and distribution in geological environments isotopic analytical methods, and extraction of isotope samples; application of isotopes in characterization of geologic processes and interaction with hydrologic, surficial, and biologic attenuation, paleothermometry soil and biochemical processes. (Typically offered: Spring)

This course is cross-listed with GEOS 5853.

ENDY 600V. ENDY Thesis Research. 1-6 Hour.

Master's Thesis. May be repeated for degree credit. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ENDY 6013. Environmental Dynamics. 3 Hours.

Required course for ENDY doctoral candidates. Overview of Earth Systems: Lithosphere; Hydrosphere, Atmosphere, Biosphere, Cryosphere, and human interaction across Earth systems. Emphasis on understanding of processes within Earth systems and interactions across Earth Systems as they pertain to global self-regulation, secular variation, climate stability, development and sustainability of human societies. Prerequisite: Graduate standing. (Typically offered: Fall)

ENDY 602V. Current Topics Seminar. 1-2 Hour.

Various aspects of the environment will be explored through topic specific seminars. Subject matter will change each semester addressing current environmental issues and research. Seminars will be one or two hours credit. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENDY 6033. Society and Environment. 3 Hours.

This course examines the complex interrelationships between human societies and the natural environment. Drawing on diverse and interdisciplinary perspectives in archaeology, ethnography, history, geography, and palaeo-environmental studies, readings and discussion will explore the co-production of social and environmental systems over time. (Typically offered: Spring)

This course is cross-listed with ANTH 6033.

ENDY 689V. Special Problems in Environmental Dynamics. 1-6 Hour.

Independent study of a topic related to environmental dynamics under the guidance of an ENDY faculty member. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ENDY 6991. Environmental Dynamics Colloquium. 1 Hour.

Weekly meetings for discussion of current research in environmental dynamics. Graduate students must register for colloquium each semester. Colloquium credit does not count towards minimum hours required for the doctorate. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ENDY 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Environmental Engineering (ENEG)

W. Micah Hale
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4190 Bell Engineering Center
479-575-4954
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Julian Fairey
Coordinator of Environmental
Engineering Studies
4190 Bell Engineering Center
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College of Engineering Website (<https://engineering.uark.edu/>)

Degree Conferred:

M.S.En.E. in Environmental Engineering (ENEG)

Program Description: The Master of Science in Environmental Engineering is a multidiscipline degree program designed for students from a multitude of academic areas. The objectives of the M.S.En.E. program are to prepare graduates for careers in environmental engineering practice with government agencies, engineering firms, or industries and to provide a foundation for continued study at the post-masters level.

Primary Areas of Faculty Research: Water treatment and distribution; waste-water collection and treatment; soil and groundwater remediation; surface and ground water quality; environmental and hydrologic modeling; animal waste management; non-point source pollution prevention; watershed management; reactor design and biomass energy; energy systems including heat transfer; thermodynamics and liquid-vapor phase change; bacterial tracers for evaluating movement through fractured subsurface strata.

M.S.En.E. in Environmental Engineering

Admission Criteria: In addition to the requirements of the Graduate School, the following are the minimum criteria for admission to the M.S.En.E. degree program:

- GPA: 3.00 or higher
- GRE Scores: No less than 302 (verbal and quantitative) and 3.5 analytical writing

Degree Requirements:

Thesis Option: A minimum of 30 semester hours of graduate-level credits, 24 semester hours of graded course work and a minimum of six semester hours of thesis.

Course Work Only Option: 30 semester hours of graded graduate-level course credits.

Both Options:

1. Upon admission to the Graduate School and acceptance in a program of study, candidates pursuing a thesis-based program will be assigned an adviser, who will assist the candidate with course selection and with finding a major adviser. The major adviser and the candidate will select a graduate committee. The candidate and major adviser, with guidance from the graduate committee, will

develop a plan of study and a research project for completion of the requirements for the degree. The graduate committee will serve as the examination committee for the research, the thesis, and the final oral and/or written examination. Candidates pursuing a coursework-based program will be assigned to a major adviser, who will assist the candidate in selection of a graduate committee, developing a plan of study; and coordination of the final oral and/or written examination.

2. No more than six graduate credit hours presented for the M.S.En.E. degree may be 4000-level.
3. Required courses listed below.

CVEG 5203 Water Chemistry

CVEG 5213 Advanced Water Treatment Design

CVEG 5224 Advanced Wastewater Treatment Design

CVEG 5233 Microbiology for Environmental Engineers

CVEG 5273 Open Channel Flow

4. Candidates for the degree must present a cumulative grade point average of 3.00 on all graduate courses. The minimum acceptable grade for any course is "C".

5. A comprehensive examination that will include either a defense of the candidate's thesis or a presentation and discussion of the candidate's course work.

6. Students should also be aware of Graduate School requirements with regard to master's degrees (<https://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext>).

7. Students should be aware that most or all of the courses in this program have prerequisite requirements. Students will be required to meet these prerequisite requirements or obtain instructor permission to enroll.

Graduate Faculty

Beitle, Robert R., Ph.D., M.S.Ch.E., B.S.Ch.E. (University of Pittsburgh), Professor, Ralph E. Martin Department of Chemical Engineering, 1993.

Clausen, Ed, Ph.D., M.S.Ch.E., B.S.Ch.E. (University of Missouri-Rolla), University Professor, Ralph E. Martin Department of Chemical Engineering, 1981.

Costello, Thomas A., Ph.D. (Louisiana State University), M.S.Ag.E., B.S.Ag.E. (University of Missouri-Columbia), Associate Professor, Department of Biological and Agricultural Engineering, 1986.

Edwards, Findlay, Ph.D. (New Mexico State University), M.S. (University of New Mexico), M.S.C.E. (New Mexico State University), Associate Professor, Department of Civil Engineering, 1999.

Fairey, Julian, Ph.D., M.S.C.E. (University of Texas at Austin), B.S.C.E. (University of Alberta, Canada), Associate Professor, Department of Civil Engineering, 2008.

Haggard, Brian Edward, Ph.D. (Oklahoma State University), M.S. (University of Arkansas), B.S. (Missouri University of Science and Technology), Professor, Department of Biological and Agricultural Engineering, 2006.

Matlock, Marty D., Ph.D., M.S., B.S. (Oklahoma State University), Professor, Department of Biological and Agricultural Engineering, 2001.

Nutter, Darin W., Ph.D. (Texas A&M University), M.S.M.E., B.S.M.E. (Oklahoma State University), Professor, Department of Mechanical Engineering, 1994.

Thoma, Greg, Ph.D. (Louisiana State University), M.S.Ch.E., B.S.Ch.E. (University of Arkansas), Professor, Ralph E. Martin Department of Chemical Engineering, 1993.

Williams, Rodney D., Ph.D., M.S., B.S.C.E. (University of Arkansas), Assistant Professor, Department of Civil Engineering, 1998.

Zhang, Wen, Ph.D. (Purdue University), M.S. (University of Kansas), Assistant Professor, Department of Civil Engineering, 2011.

Exercise Science (EXSC)

Matthew S. Ganio
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479-575-2857
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Paul Calleja
Assistant Department Head
306C HPER Building
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Degree Conferred:

M.S. in Exercise Science (EXSC)

Program Description: The Exercise Science master's program prepares students with the competencies necessary to pursue The minimum number of credit hours for the M.S. degree is 33 hours.

Requirements for M.S. in Exercise Science

Prerequisites to Degree Program: For acceptance to the master's degree programs, the program area requires, in addition to the general requirements for admission to the Graduate School, an undergraduate degree in kinesiology or in a related field and the following admission standards: an overall undergraduate GPA of 3.00 or if the overall undergraduate GPA is between 2.70 and 2.99, the student must have a 3.00 GPA on the last 60 hours of undergraduate course work (excluding student teaching), or a GRE score of 290 or higher on the verbal and quantitative parts of the general test. Students must submit a CV/Resume, statement of purpose, and the names and contact information for three references.

Requirements for the Master of Science Degree: Candidates for the M.S. degree in Exercise Science must complete 27 semester hours of graduate work and a thesis (6 credit hours) or 33 semester hours without a thesis. A graduate GPA of 3.0 or better is required for graduation. In addition, all degree candidates must successfully complete a written comprehensive examination.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Required Research Component (6 hours)

ESRM 5393	Statistics in Education and Health Professions	3
HHPR 5353	Research in Health, Human Performance and Recreation	3

Required Core Courses (9 hours)

EXSC 5323	Biomechanics I	3
EXSC 5513	Physiology Exercise I	3
EXSC 5593	Practicum in Laboratory Instrumentation	3

Required Project or Thesis (3-6 hours)

KINS 589V	Independent Research	1-3
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KINS 600V	Master's Thesis	1-6
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Approved Electives 12-15

EXSC 5333	Instrumentation in Biomechanics
EXSC 5353	Exercise Psychology
EXSC 5443	Seminar in Brain Injury and Behavior
EXSC 5523	Muscle Metabolism in Exercise
EXSC 5533	Cardiac Rehabilitation Program
EXSC 5543	Cardiovascular Function in Exercise
EXSC 5613	Physical Dimensions of Aging
EXSC 5643	Advanced Psychology of Sports Injury and Rehabilitation
EXSC 5773	Performance and Drugs
EXSC 6313	Muscle Physiology
EXSC 6323	Biomechanics II
EXSC 6343	Physiology of Exercise II
EXSC 6443	Thermoregulation and Fluid Balance

Total Hours	33
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Courses

EXSC 5023. Advanced Teaching in Exercise Science. 3 Hours.

Examination and practical exposure to the principles and practices of undergraduate teaching in exercise science. Includes course planning, teaching techniques, assessment strategies, and supervised practice. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EXSC 5323. Biomechanics I. 3 Hours.

Intended to serve as an introduction to biomechanics and focuses on scientific principles involved in understanding and analyzing human motion. (Typically offered: Fall)

EXSC 5333. Instrumentation in Biomechanics. 3 Hours.

The application of knowledge and skills necessary for data collection for sports analysis. Provides valuable information on instrumentation used specifically in biomechanics. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 5353. Exercise Psychology. 3 Hours.

Exercise Psychology is a lecture and discussion format for students interested in learning about theoretical and research information related to exercise adherence. (Typically offered: Fall)

EXSC 5443. Seminar in Brain Injury and Behavior. 3 Hours.

The Brain Injury and Behavior Seminar will immerse you in specific topics pertaining to the study of human brain-behavior relationships. Emphasis will be placed on traumatic brain injury (TBI), including moderate-to-severe injuries, as well as mild TBI or concussion. The first half of the course will focus on research related to how individuals sustain and recover from TBI. The second half of the course will focus on sports-related concussion in youth, collegiate, and professional athletes, with an emphasis on how athletes sustain concussions, how concussions are assessed, treated, and managed, and how return-to-play decision are made. This course will introduce you to research in a variety of fields that include physiology, neurology, and neuropsychology through primary source material in the form of book chapters and journal articles. (Typically offered: Irregular)

EXSC 5513. Physiology Exercise I. 3 Hours.

A study of the foundation literature in exercise physiology. Emphasis is placed on the muscular, cardiovascular, and respiratory systems. (Typically offered: Fall)

EXSC 5523. Muscle Metabolism in Exercise. 3 Hours.

A study of the metabolic changes that occur in muscle as a result of exercise, exercise training, and other stressors. Prerequisite: EXSC 5513 or equivalent. (Typically offered: Spring)

EXSC 5533. Cardiac Rehabilitation Program. 3 Hours.

An examination of the concepts, design, and implementation of cardiac rehabilitation programs. Emphasis on exercise programs but reference to nutrition, psychology, and other lifestyle interventions. (Typically offered: Spring Even Years)

EXSC 5543. Cardiovascular Function in Exercise. 3 Hours.

Study of the effects of exercise training and other stressors on the cardiovascular system. Detailed study of the components of the cardiovascular system and the responses and adaptations of those components to selected stimuli. Corequisite: EXSC 5513 or equivalent. (Typically offered: Fall Even Years)

EXSC 5593. Practicum in Laboratory Instrumentation. 3 Hours.

Practical experience in testing physical fitness utilizing laboratory equipment. Objective is to quantify physiological parameters, leading to the individualized exercise prescription. (Typically offered: Fall and Summer)

EXSC 5613. Physical Dimensions of Aging. 3 Hours.

This course will focus on the physiological changes with healthy aging, pathophysiology of age-related diseases, testing issues, exercise interventions, and the psychosocial aspects of aging. Prerequisite: EXSC 5513. (Typically offered: Spring Odd Years)

EXSC 5643. Advanced Psychology of Sports Injury and Rehabilitation. 3 Hours.

The purpose of this course is to explore and discuss factors related to the psychological aspects of athletic injuries. These factors include the sociocultural, mental, emotional, and physical dimensions of injury rehabilitation. (Typically offered: Spring)

EXSC 5773. Performance and Drugs. 3 Hours.

The pharmacological and physiological effects of ergogenic aids upon the athlete and performance coupled with the ethical and moralistic viewpoints of drug taking. Practical laboratory experiences are provided with pertinent statistical surveys of athletes; their drug taking habits and relevant psychological impact on performance. (Typically offered: Spring)

EXSC 6313. Muscle Physiology. 3 Hours.

To expand the student's knowledge of the skeletal muscle form and function. Specifically, how muscle is formed to how it can adapt as a post-mitotic tissue. This course will focus on the morphological, physiological, cellular, and molecular factors that affect skeletal muscle form and function. (Typically offered: Fall Even Years)

EXSC 6323. Biomechanics II. 3 Hours.

Analysis of human movement with emphasis on sports skills by application of principles of anatomy, kinesiology, and cinematographical analysis. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 6343. Physiology of Exercise II. 3 Hours.

Detailed study of the body systems affected by exercise, the functions of these systems during exercise, the effects of age, sex, body type, and nutrition on capacity for exercise, the techniques of assessing work capacity, and a critical analysis of research literature in this area. (Typically offered: Irregular)

EXSC 6443. Thermoregulation and Fluid Balance. 3 Hours.

Comprehensive overview of human thermoregulatory responses to exercise in heat and cold. (Typically offered: Spring Even Years)

Food Safety (FDFS)

Vicky Watkins
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Kristin Seals
Program Coordinator
AFLS D112

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Degree Conferred:
M.S. in Food Safety (FDSF)

Master of Science Program: The Master of Science in Food Safety is designed to prepare students for higher positions in the food industry. The program provides a subject matter core of courses in food microbiology, sanitation, food processing, epidemiology, food law, HACCP applications, human diseases, and other quality control areas facing the food industry.

Requirements for M.S. in Food Safety

The Master of Science in Food Safety program requires a total of 30 hours of graduate-level work. Each student will complete one three-hour special problem in which a technical paper will be developed. This requirement may be satisfied by an approved thesis project in the Poultry or Food Science department. No more than a total of 6 hours of thesis, special problems and internships are recognized for degree requirements with no more than a total of 6 hours of special problems and internships. Each special problem course should be limited to three hours of credit. An oral examination over all course work and the special problem project or thesis is required.

The student's advisory committee will outline the total program of study and will also determine if any course deficiencies should be addressed. An applicant must meet all of the requirements for admission to the Graduate School. The program's steering committee provides guidelines for student admission and establishes degree requirements. The student and the Program Coordinator, with approval of the Dean of the Graduate School, select a major adviser. The major adviser, in consultation with the student, will recommend additional faculty members to serve on the student's advisory committee, including one member from the program steering committee.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Food Science (FDSC)

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Department of Food Science website (<http://food-science.uark.edu>)

Degrees Conferred:
M.S., Ph.D. (FDSC)

Program Description: The M.S. and Ph.D. programs in Food Science provide students with graduate education and research experience, both

fundamental and applied, aimed at enhancing production and processing techniques, assuring food safety, utilizing co-products of food processing, improving the sensory and nutritional quality of food and understanding the role of nutrition in health and disease. Interdisciplinary faculty with comprehensive expertise in the food and food-related sciences, along with state-of-the-art facilities, are capable of addressing the most complex fundamental and applied research problems.

Primary Areas of Faculty Research: Post-harvest technologies; food engineering; new value-added products and process development; methodology and assessment of quality attributes of raw and processed foods; food biochemistry; food microbiology; food processing and packaging; lipid, protein, and carbohydrate chemistry; food enzymology; functional foods; nutraceuticals; food safety; sensory analysis, human nutrition and chronic diseases.

M.S. in Food Science

Admission to Master of Science Degree Program: The student must have a B.S. degree from an accredited institution with a grade-point average of no less than 3.00, minimum GRE score percentiles of 30 for verbal, 25 for quantitative and a score of at least 3.0 for writing, suitable preparation in food science or related areas, and be acceptable to the department. International students must also have a minimum TOEFL score 79 internet-based/550 paper-based and 6.5 IELTS.

Requirements for the Master of Science Degree: A minimum of 24 semester hours of course work and 6 semester hours of thesis are required for the M.S. degree. At least 14 course credits of the 24 credits required must be from 5000-level or higher courses. Students are required to complete FDSC 5001 Seminar twice — one proposal seminar and one final seminar. Course deficiencies, if any, will be identified at the time of acceptance. In addition to coursework, the student will be required to conduct research and prepare an acceptable thesis. Upon admission to this program the candidate will be assigned to a thesis director, who in consultation with the department head will select a graduate committee. This committee will assist with developing a suitable program for the candidate and will serve as the examination committee.

The student must maintain a grade-point average of 3.00 or higher.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Food Science

Admission to Doctor of Philosophy Degree Program: Applicants for acceptance into the interdepartmental doctoral program in food science must meet all of the requirements for admission to the Graduate School and the Department of Food Science. Students with a B.S. or M.S. degree in Food Science or related sciences from an accredited institution should have a GPA of no less than 3.0. All applicants to the Ph.D. program (B.S. and M.S.) should have a minimum GRE percentile of 30 for verbal, 25 for quantitative and a minimum score of 3.0 for writing, suitable preparation for the food science graduate program, and be acceptable to the department. International students must also have a minimum TOEFL score of 79 internet-based/550 paper-based and 6.5 IELTS.

Requirements for the Doctor of Philosophy Degree: Upon acceptance to this program, the student will be assigned to a dissertation director from the department representing the student's selected area of research. The dissertation director in consultation with the student and with the department head will select at least two suitable graduate faculty members from outside the student's own department to complete a committee of five members. The doctoral advisory committee chaired by

the dissertation director will be responsible for supervision of the student's program development, and will serve as the examination committee for candidacy and final examinations. The student's course work and dissertation topic will be supervised by the doctoral advisory committee.

For students holding an M.S. degree in a science discipline, a minimum of 24 semester hours of course credit and a minimum of 18 semester hours of Ph.D. dissertation research credit will be required. At least 18 course credits of the 24 credits required must be from 5000-level or higher courses. Students are required to complete FDSC 5001 Seminar twice — one proposal seminar and one final seminar. Course deficiencies, if any, will be identified at the time of acceptance.

For students holding a B.S. degree in a science discipline, a minimum of 48 semester hours of course credit, a minimum of 18 semester hours of Ph.D. dissertation research credit, and a total of 72 semester hours of credit will be required. At least 32 course credits of the 48 credits required must be 5000-level or higher courses. Students are required to complete FDSC 5001 Seminar twice — one proposal seminar and one final seminar. Course deficiencies, if any, will be identified at the time of acceptance.

The student must maintain a grade-point average of 3.00 or higher. General requirements pertaining to the declaration of intent, admission to candidacy and residency are in accordance with the requirements set forth by the Graduate School of the University of Arkansas.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Atungulu, Griffiths Odhiambo, Ph.D., M.S. (Iwate University, Japan), B.S. (Jomo Kenyatta University of Agriculture and Technology, Kenya), Associate Professor, 2013.

Baum, Jamie I., Ph.D., B.S. (University of Illinois-Urbana-Champaign), Associate Professor, 2011.

Crandall, Philip G., Ph.D., M.S. (Purdue University), B.S. (Kansas State University), Professor, 1989.

Gibson, Kristen Elizabeth, Ph.D. (Johns Hopkins University), B.S. (University of Central Florida), Associate Professor, 2012.

Hettiarachchy, Navam S., Ph.D. (University of Hull, England), M.S. (Edinburgh University, Scotland), B.S. (University of Madras, India), University Professor, 1992.

Howard, Luke R., Ph.D., M.S. (University of Arkansas), B.S. (Purdue University), Professor, 2002.

Lee, Sun-Ok, Ph.D., M.S. (Iowa State University), M.S., B.S. (Dongduk Women's University, South Korea), Associate Professor, 2008.

Meullenet, Jean-François, Ph.D. (University of Georgia), M.S. (National Superior School of Agronomy and Food Science, Nancy, France), Professor, 1996.

Morawicki, Ruben O., Ph.D. (Pennsylvania State University), M.Eng. (State University of New York-Buffalo), B.S. (Universidad Nacional de Misiones, Argentina), Associate Professor, 2006.

Ricke, Steven C., Ph.D. (University of Wisconsin-Madison), M.S., B.S. (University of Illinois), Professor, 2005.

Seo, Han-Seok, Dr.rer.Medic. (Technische Universität Dresden, Germany), Ph.D., M.Sc. (Seoul National University, South Korea), B.S. (Korea University, Seoul, South Korea), Associate Professor, 2012.

Siebenmorgen, Terrence J., Ph.D. (University of Nebraska-Lincoln), M.S.Ag.E. (Purdue University), B.S.Ag.E. (University of Arkansas), Distinguished Professor, 1984.

Subbiah, Jeyamkondan, Ph.D. (Oklahoma State University), M.S. (University of Manitoba, Canada), B.E. (Tamil Nadu Agricultural University, India), Professor, 2019.

Wang, Ya-Jane, Ph.D. (Iowa State University), M.S. (University of Minnesota-Twin Cities), B.S. (National Taiwan University), Professor, 1999.

Courses

FDSC 5001. Seminar. 1 Hour.

Presentation and discussion of graduate student research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 2 hours of degree credit.

FDSC 509V. Special Problems Research. 1-6 Hour.

Original investigation on assigned problems in food science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

FDSC 5111L. Food Analysis Lab. 1 Hour.

(Formerly FDSC 4111L.) Laboratory exercises providing students with experience of analytical techniques and instrumentation used in food analysis. Laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 4111L and FDSC 5111L. Corequisite: FDSC 4113 or FDSC 5113 (formerly FDSC 4113). Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304) and CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L). (Typically offered: Spring)

FDSC 5113. Food Analysis. 3 Hours.

(Formerly FDSC 4113.) Methods of analysis, instrumentation, and laboratory techniques for measuring the chemical composition of raw and value-added products. Lecture 3 hours. Graduate degree credit will not be given for both FDSC 4113 and FDSC 5113. Corequisite: FDSC 4111L or FDSC 5111L (formerly FDSC 4111L). Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304) and CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L). (Typically offered: Spring)

FDSC 5121L. Food Microbiology Lab. 1 Hour.

(Formerly FDSC 4121L.) A hands-on laboratory course designed to teach students microbiological techniques and certain enumeration and plating techniques of specific food spoilage and pathogenic bacteria. Graduate degree credit will not be given for both FDSC 4121L and FDSC 5121L. Pre- or Corequisite: FDSC 4122 or FDSC 5122 (formerly FDSC 4122). (Typically offered: Fall)

FDSC 5122. Food Microbiology. 2 Hours.

(Formerly FDSC 4122.) The study of food microbiology including classification/taxonomy, contamination, preservation and spoilage of different kinds of foods, pathogenic microorganisms, food poisoning, sanitation, control and inspection and beneficial uses of microorganisms. Graduate degree credit will not be given for both FDSC 4122 and FDSC 5122. Prerequisite: BIOL 2013 and BIOL 2011L or BIOL 2533. (Typically offered: Fall)

FDSC 5223. Food Biosecurity. 3 Hours.

This course is the study of the security of agricultural products and the protection of our food supply from intentional and accidental, domestic and international contamination. Prerequisite: Graduate standing. (Typically offered: Irregular)

FDSC 5304. Food Chemistry. 4 Hours.

(Formerly FDSC 4304.) Water, carbohydrates, lipids, proteins, vitamins, and minerals in foods; biochemical and functional properties, enzymes, food additives (emulsifiers, pigments, colors, flavors, preservatives, and sweeteners) and texture as related to properties in food systems and during processing. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 4304 and FDSC 5304. Corequisite: Lab component. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L). (Typically offered: Fall)

FDSC 531V. Internship in Food Science. 1-4 Hour.

(Formerly FDSC 431V.) The Food Science Internship is a supervised practical work experience with a food industry, research program or governmental agency to gain professional experience and insight into career opportunities. Graduate degree credit will not be given for both FDSC 431V and FDSC 531V. Prerequisite: Completion of first year of graduate studies and instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

FDSC 5413. Sensory Evaluation of Food. 3 Hours.

(Formerly FDSC 4413.) Principles and procedures for sensory evaluation of food. Appropriate uses of specific tests are discussed, along with physiological, psychological, and environmental factors affecting sensory verdicts. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both FDSC 4413 and FDSC 5413. Corequisite: Lab component. Prerequisite: STAT 2303 or WCOB 1033 or AGST 5023 or STAT 2823 or PSYC 2013. (Typically offered: Fall)

FDSC 5423. Foodborne Diseases. 3 Hours.

This course will introduce students to the major pathogens associated with foodborne diseases, their epidemiology, and approaches to outbreak investigation and control of foodborne illness. An emphasis will be placed on understanding the relationships between the host, the etiologic agent, and the environment as they relate to disease causation. The student will gain knowledge through lectures, case studies, readings, and an individual project. An understanding of basic biology principles is expected for this course. (Typically offered: Summer Odd Years)

FDSC 5503. Safety and Sanitation for the Food Industry. 3 Hours.

This web-based course will provide an appreciation of the need for sanitation in food processing and increase the students' knowledge of sanitary techniques. Topics will include contamination sources, plant and equipment design, cleaners and sanitizers, HACCP, and food biosecurity. Also covered will be considerations in selecting, establishing and maintaining a sanitation program. An understanding of general microbiology and chemistry principles is expected for this course. (Typically offered: Irregular)

FDSC 5713. Product Innovation for the Food Scientist. 3 Hours.

(Formerly FDSC 4713.) This is a capstone course integrating knowledge developed in Food Science to the development of new food products. This course will take an integrated multidisciplinary approach to developing innovative food products and will provide learning experiences in new product development and Research & Development. Topics include product formulation, ingredient interactions, sensory analysis, packaging, labeling, food safety and food law. Graduate degree credit will not be given for both FDSC 4713 and FDSC 5713. Corequisite: Lab component. Pre- or Corequisite: FDSC 4113 or FDSC 5113 (formerly FDSC 4113) and FDSC 4111L or FDSC 5111L (formerly FDSC 4111L). Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304), FDSC 3103, and FDSC 4413 or FDSC 5413 (formerly FDSC 4413). (Typically offered: Spring)

FDSC 5754. Engineering Principles of Food Processing. 4 Hours.

(Formerly FDSC 4754.) Basic mechanics of refrigeration, temperature controls, materials handling and mechanical problems as applied to foods and food processing. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 4754 and FDSC 5754. Corequisite: Lab component. Prerequisite: MATH 1213, PHYS 2013, and PHYS 2011L. (Typically offered: Spring Even Years)

FDSC 5823. Principles of Food Microbiology. 3 Hours.

This web-based course is a study of the fundamentals of food microbiology to include its history, classifications, spores and their importance, and the most common and serious pathogenic food microorganisms. Fermentation, spoilage microorganisms and control methodology are also discussed. (Typically offered: Irregular)

FDSC 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with AGED 5993, HORT 5993.

FDSC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

FDSC 602V. Special Topics. 1-3 Hour.

Discussions focused on selected topics of particular fields of raw product physiology and food processing. chemistry, physiology, microbiology, evaluation, sensory analysis and preservation. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

FDSC 6033. Food Biochemistry. 3 Hours.

Biochemical characteristics, functions, regulation and impact of components in raw and processed foods of plant origin. Lecture/discussion 3 hours per week. Prerequisite: CHEM 3813. (Typically offered: Fall Odd Years)

FDSC 6123. Food Carbohydrate Chemistry. 3 Hours.

Focus is on carbohydrate chemistry including molecular structures and physical properties, production and food applications, analytical methods for food carbohydrates, and interactions among food polysaccharides. Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304). (Typically offered: Fall Even Years)

FDSC 6143. Advanced Food Processing and Packaging and their Environmental Impact. 3 Hours.

The course is directed to graduate students in food science and related fields. Students will learn advanced food processing technologies and packaging as well as the environmental issues associated to food production, processing, and distribution. An understanding of basic food processing/food engineering principles and knowledge of food processing operations is expected for this course. (Typically offered: Spring Even Years)

FDSC 6323. Nutraceuticals and Functional Foods. 3 Hours.

Course will include past, present and future of nutraceuticals and functional foods, chemistry, mechanism, novel technologies, nutrigenomics, processing, healthy lifestyle, regulation, safety, marketing, international aspects, and industry project. Prerequisite: CHEM 2613 (or CHEM 3603) and CHEM 3813 and FDSC 4304 or instructor consent. (Typically offered: Spring Even Years)

FDSC 6333. Food Protein Chemistry and Functionality. 3 Hours.

This course is a study in advanced food protein chemistry, including molecular structures, characterization, physicochemical bases of food protein functionality, structure-function relationship, processing technologies to improve functionality, as well as hands-on experiences with timely, practical projects related to food proteins. Lecture and problem solving projects for 3 hours per week. Pre- or Corequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304). (Typically offered: Spring Odd Years)

FDSC 6403. Epidemiologic Principles in Food Safety and Public Health. 3 Hours.

This course will provide an introduction to epidemiologic methods used in foodborne disease outbreak investigations. The importance of surveillance systems in detecting outbreaks and in the development of effective disease prevention and control strategies will also be presented. An emphasis will be placed on understanding the relationships between the host, the etiologic agent, and the environment as they relate to disease causation. In addition, molecular methods utilized for the identification of etiologic agents will be discussed. Selected important foodborne diseases will be discussed in detail to clarify the role of epidemiology in understanding the pathogenesis of infectious processes in individuals and communities. Prerequisite: FDSC 4122 or FDSC 5122 (formerly FDSC 4122) or equivalent. (Typically offered: Fall Even Years)

FDSC 6443. Metabolism of Xenobiotics. 3 Hours.

This course is designed to provide in-depth knowledge of the integration of molecular, cellular, and physiologic aspects of xenobiotics (e.g phytochemicals)/ micronutrients and metabolism. This course will also discuss the current understanding of the mechanism and regulation of gene expression by xenobiotics/ micronutrients. Examination of current research literature to understand how xenobiotics/micronutrients and physiological states metabolize and influence gene expression, as well as the research methodology used to address these relations. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

FDSC 6603. Chemosensory Perception and Measurement. 3 Hours.

This course is designed to address advanced techniques and current issues in sensory and consumer sciences, with a focus on chemosensory perception. This course consists of two main modules: I) anatomy and physiology of the chemosensory senses and II) measurement/analysis of chemosensory responses. This course includes both individual and group projects with an emphasis of four aspects of 'C': 'Concept,' 'Creativity,' 'Critical thinking skills,' and 'Communication.' Prerequisite: FDSC 4413 or FDSC 5413. (Typically offered: Fall Odd Years)

FDSC 700V. Doctoral Dissertation. 1-18 Hour.

The doctoral program in food science is an interdepartmental program offered by the departments of Food Science, Animal and Poultry Sciences, and Human Environmental Sciences. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

French

See World Languages, Literatures, and Cultures (p. 328).

Courses

FREN 5003. French Grammar and Phonetics. 3 Hours.

Systematic review of principles of French grammar and syntax; comprehensive presentation of French phonetics. (Typically offered: Irregular)

FREN 5033. Advanced French Conversation. 3 Hours.

This course will provide a small discussion environment in which graduate students will improve their command of spoken French in an interactive setting. Discussion will concentrate on current cultural issues in the French speaking world. (Typically offered: Irregular)

FREN 5333. Old French Literature. 3 Hours.

An intensive study of French Medieval Literature from the Chansons de Geste to Villon, including an in-depth analysis of the genres and their evolution, and of the major authors of the times. (Typically offered: Irregular)

FREN 5353. Survey of French Poetry. 3 Hours.

A comprehensive study of French poetry from the Middle Ages to the twentieth century, focusing on close readings of individual poems. This course will cover literary movements and trends of the periods and presents the terminology required to do explication de texte. (Typically offered: Irregular)

FREN 5433. French 16th-Century Literature. 3 Hours.

A survey of representative writers of the sixteenth century. (Typically offered: Irregular)

FREN 5543. French 17th-Century Literature. 3 Hours.

A survey of representative writers of the seventeenth century. (Typically offered: Irregular)

FREN 5673. French 18th-Century Literature. 3 Hours.

French 18th-Century literature. (Typically offered: Irregular)

FREN 5703. Special Topics. 3 Hours.

May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

FREN 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

FREN 5773. Survey of Francophone Literature. 3 Hours.

A survey of representative texts in the field of sub-Saharan and North African literature concentrating on postcolonial novels using contemporary critical approaches. (Typically offered: Irregular)

FREN 5783. The French Nineteenth-Century Novel. 3 Hours.

The French Nineteenth-Century novel. (Typically offered: Irregular)

FREN 5833. French 20th-Century Novel. 3 Hours.

French 20th-Century novel. (Typically offered: Irregular)

Geosciences (GEOS)

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Department of Geosciences Website (<http://fulbright.uark.edu/departments/geosciences/>)

Degrees Conferred:

M.S. in Geography (GEOG)
M.S. in Geology (GEOL)
Ph.D. in Geosciences (GEOS)

Graduate Certificates Offered (non-degree):
Geospatial Technologies (GIST)

Geography (GEOG) (M.S.)

Areas of Study: Human geography, physical geography, GIS, cartography, space and planetary sciences.

Program Description: The Department of Geosciences offers a Master of Science (M.S.) degree in geography. This program draws on a variety of faculty expertise in physical, environmental, human, and regional studies in geography as well as in cartography, remote sensing, photogrammetry, and computational aspects of geographic information science (GIS) or geoinformatics.

Geology (GEOL) (M.S.)

Areas of Study: General geology, space and planetary sciences

Program Description: Instruction in geology at the graduate level focuses on preparation of students to become practicing professional geologists in industry or to pursue, without deficiencies, doctorates at established programs. Students intending to enter the industrial workforce are encouraged to maintain a broad perspective with an emphasis in an area of geology that has a demonstrated record of past employment, such as petroleum geology or environmental geology. The greatest strength of the program in geology at the University of Arkansas is instruction in practical geologic interpretation, with emphasis on field relationships. This instructional strength includes all levels of teaching and supports an active research program that serves to strengthen the research and communication skills of the students through writing assignments, oral presentations, and participation in professional societies.

Geosciences (GEOS) (Ph.D.)

Primary Areas of Faculty Research:

1. Basin evolution and analysis (including multiple aspects of petroleum geology that incorporate sedimentation, structural geology, stratigraphy and geophysics),
2. Crustal and mantle composition and tectonic evolution,
3. Neotectonics and dynamic geomorphology,
4. Geoinformatics (including GIS, remote sensing, GPS geodesy, and geospatial analysis),
5. Groundwater dynamics, karst hydrology and limnology, and
6. Paleoclimatology.

The Department of Geosciences focuses on research and education dealing with the nature, genesis, and history of the Earth and the global environment, the evolution of landscapes and biota at the Earth's surface, and the advance of geospatial technologies. The Doctor of Philosophy degree is designed for students who are committed to scholarship in the geosciences and who wish to prepare for professional employment within the academic community, industry, or government. Geosciences research requires rigorous observation, quantitative analysis, and modeling in order to yield scientific results that are acceptable for publication in first-rate, internationally-ranked journals. Given the interdisciplinary nature of Geosciences, the Department of Geosciences encourages research including elements of space and planetary sciences, biological sciences, environmental sciences, physics and chemistry to address relevant problems at the boundaries of geoscience and other disciplines.

Applicants for the doctoral program must have completed the baccalaureate degree with a major in geosciences or an allied discipline. Students with academic preparation at the undergraduate or masters level in other disciplines of physical science, engineering, and mathematics are also encouraged to apply. All applicants must submit their scores on the Graduate Record Examination directly to the University of

Arkansas Graduate School, provide three letters of recommendation from individuals qualified to assess the applicant's academic potential, a personal curriculum vita, and a statement of academic and research interests.

Qualified students with a bachelor's degree or a master's degree may be accepted into the Ph.D. program. Academic requirements for admission to the program are listed in the table below. In addition, prospective applicants are encouraged to contact Department of Geosciences faculty with similar research interests to initiate dialogue regarding availability for mentoring, potential research topics, and research funding opportunities.

M.S. in Geography

Admissions to Degree Program: Applicants must be admitted to the Graduate School and meet the following requirements: 1) satisfactory undergraduate preparation in geography, 2) three letters from persons competent to judge the applicant's potential for graduate studies, 3) satisfactory GRE scores, and 4) adequate mathematical preparation at the undergraduate level, including statistics, algebra, and/or calculus. Students who do not meet these requirements may be admitted conditionally. Students with course deficiencies may enroll concurrently in graduate courses. Students speaking English as a foreign language are encouraged to take the TOEFL with results reported to the department.

Degree Requirements: Requires a total of 30 semester hours. A minimum of 24 semester hours of course work (including a 6-hour core and 6 hours of quantitative or computational electives), 6 semester hours of thesis credit, and a comprehensive examination (defense of thesis) conducted by the candidate's thesis committee are required for all students who obtain an M.S. degree in Geography. Quantitative or computational electives not listed in the Department's Graduate Student Handbook must be pre-approved by the master's advisory committee.

Core

GEOS 5093	History and Philosophy of Geography	3
GEOS 5612	Research Methods in Geosciences	2
GEOS 5011	Colloquium	1

Quantitative or Computational Electives

Quantitative or computational courses approved by Department or master's advisory committee	6
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Other Electives

Courses in consultation with master's advisory committee	12
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Thesis

GEOS 600V	Master's Thesis	6
Total Hours		30

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.S. in Geology

Admission to Degree Program: Students admitted to graduate study should have completed an undergraduate geology program similar to that required for the B.S. degree at the University of Arkansas. Applicants lacking an appropriate background may satisfy deficiencies while enrolled in Graduate School. Prospective students should submit application forms, three letters of recommendation, and a statement of their graduate and professional goals before January 15 for the fall semester and October 15 for the spring semester to assure their consideration. These dates are also deadlines for receipt of application for financial assistance.

Requirements for the Master of Science Degree: The program in Geology requires 30 graduate course credit hours, six of which will be derived from a thesis reporting the results of an original research problem. All course work, a thesis topic, and the final thesis must be approved by the student's thesis committee. This committee is selected by the student and the student's thesis director and will consist of a minimum of three members. At least two of the committee members will be chosen from geology faculty whose areas of expertise coincide with the research interests of the student.

Thesis		6
GEOS 5612	Research Methods in Geosciences	2
GEOS 5011	Colloquium	1
Electives at 5000 level		12
Taught by Geology faculty and not to include unnamed special topics and independent study.		
Additional Electives		9
To be determined in consultation with the thesis adviser and advisory committee.		
Total Hours		30

A listing of geology Faculty can be found in the Geosciences Graduate Student Handbook.

Courses transferred or previously taken as an undergraduate may not be used for graduate credit toward the 24 credit hour requirement. Students should be aware that courses taken to fulfill deficiencies as graduate students will incur graduate tuition.

To complete the requirements for the degree, the candidate must complete all course work with a grade-point average of 3.00, submit an acceptable thesis, and pass a comprehensive examination based primarily on a defense of the student's thesis.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Geosciences

Geosciences-specific requirements are intended to be in harmony with those of the Graduate Catalog admissions (<http://catalog.uark.edu/graduatecatalog/admissions/>) and requirements for Ph.D. degrees (<http://catalog.uark.edu/graduatecatalog/degreerequirements/#phdandeddegreetext>) as well as all other university-level requirements. Supplemental information can be found in Department of Geosciences Graduate Handbook. In case of conflict, university-level requirements prevail, followed by Geosciences program requirements found below. Exceptions to program requirements, in consultation with the adviser, must be approved by the Geosciences Ph.D. coordinator and the department chair.

Admission Requirements:

- Undergraduate and graduate GPA as well as GRE (Verbal, Quantitative, and Writing) will be reviewed on a competitive basis by the Geosciences Ph.D. admissions committee
- Recommendations: Three (3) letters of recommendation from individuals qualified to assess the applicant's academic potential
- Acceptance by an adviser
- Current curriculum vitae
- Statement of academic and research interests

- Submit application by Jan. 15 for the fall semester to assure consideration

Degree Requirements:

- 24 course hours beyond the M.S. Geography, M.S. Geology, or an equivalent master's degree (or for those starting the program without a master's, 48 course hours beyond a related bachelor's degree)
- GEOS 5612 Research Methods in Geosciences
- GEOS 5011 Colloquium
- Two courses outside of the department that are supplementary to the student's interests and dissertation topic; these may be 3000-level undergraduate courses, if approved by the advisory committee and the Graduate School and International Education.
- No more than 3 course hours of special problems or independent study
- The Ph.D. degree is primarily a research degree, but communication of that research is critical for extension and application of research results as well as professional development; in order to advance communication skills, each student is required to teach labs and/or a course for at least one semester and/or to present scientific results at one or more national or international professional meetings. In addition, each student will present a departmental colloquium on the dissertation topic.

Examination for Candidacy: Two candidacy exams should be taken within the first two years of graduate study and after completion of 12 hours of graduate study, including Research Methods in Geosciences and Colloquium (see above). The candidacy exams are administered by the advisory committee (consisting of the adviser plus 3-5 additional faculty members) during full-semester classes. The first exam is a review paper written using the format and length of a specified refereed journal. The committee will assign the paper topic and journal style, and the paper will be due 30 days later. The advisory committee will determine whether the quality of the review paper demonstrates sufficient preparation for independent dissertation research. The second candidacy exam is an oral defense of a written dissertation proposal. The format of the written dissertation proposal will be specified by the advisory committee. The defense must demonstrate to the advisory committee that the student is prepared to move to the independent dissertation-research stage. Upon successful admission to candidacy, the advisory committee is dissolved, and a dissertation committee (adviser plus 2-4 additional faculty members) may then be formed.

Graduate Certificate in Geospatial Technologies

The Department of Geosciences offers an online Geospatial Technologies Graduate Certificate through University of Arkansas Global Campus (<http://globalcampus.uark.edu/>). This certificate is designed for working professionals who wish to develop technical skills in the emerging field of geospatial technologies. The certificate provides the technical instruction needed to be employed in the geosciences and collateral disciplines as one of the American Society of Photogrammetry and Remote Sensing's "Mapping Scientist" and as a "Certified Geographic Information Systems Professional" (GISP).

Requirements for a Geospatial Technologies Graduate Certificate

Requirements for admission: Graduate status; there are no disciplinary requirements.

A total of 12-18 hours are required for the certificate:

GEOS 5043	Foundations of Geospatial Data Analysis	3
GEOS 5073	Geospatial Technologies Computational Toolkit	3
GEOS 5083	Geospatial Data Mining	3
GEOS 5543	Geospatial Applications and Information Science	3
GEOS 5553	Spatial Analysis Using ArcGIS	3
GEOS 5593	Introduction to Geodatabases	3

It is possible to waive 3 to 6 hours of required coursework for GEOS 5043 and GEOS 5073 through successful completion of proficiency exams.

Graduate Faculty

Aly, Mohamed H., Ph.D. (Texas A&M), M.S., B.S. (Zagazig University), Assistant Professor, 2013.

Boss, Steve K., Ph.D. (University of North Carolina at Chapel Hill), M.S. (Utah State University), B.S. (Bemidji State University), Professor, 1996.

Cheng, Linyin, Ph.D. (University of California, Irvine), M.S. (Clarkson University), B.S. (Sichuan University), Assistant Professor, 2018.

Cothren, Jackson David, Ph.D., M.S. (The Ohio State University), B.S. (United States Air Force Academy), Associate Professor, 2004.

Covington, Matthew D., Ph.D. (University of California-Santa Cruz), B.A. (University of Arkansas), Associate Professor, 2012.

Davidson, Fiona M., Ph.D., M.A. (University of Nebraska-Lincoln), B.A. (Newcastle Upon Tyne Polytechnic), Associate Professor, 1992.

Davis, Ralph K., Ph.D., M.S., B.S. (University of Nebraska, Lincoln), Professor, 1994.

de Avila Fernandes, Katia, Ph.D. (Georgia Institute of Technology), Assistant Professor, 2019.

Dumond, Gregory, Ph.D. (University of Massachusetts), M.S. (Texas Tech University), B.S. (University of Texas El Paso), Associate Professor, 2010.

Feng, Song, Ph.D., M.S. (Chinese Academy of Sciences), B.S. (Yunnan University), Associate Professor, 2013.

Hays, Phillip D., Ph.D., M.S. (Texas A&M University), B.S. (University of Arkansas), Research Professor, 2000.

Hintz, Rashauna, M.A., B.A. (University of Arkansas), Instructor, 2011.

Holland, Edward C., Ph.D., M.A. (University of Colorado, Boulder), B.A. (Princeton University), Assistant Professor, 2016.

Lamb, Andrew P., Ph.D. (Boise State University), M.S. (Florida Institute of Technology), B.S. (University of Dublin, Trinity), Assistant Professor, 2017.

Limp, Fred, Ph.D., M.A., B.A. (Indiana University at Bloomington), University Professor, 1979.

Liner, Christopher L., Ph.D. (Colorado School of Mines), M.S. (University of Tulsa), B.S. (University of Arkansas), Professor, 2012.

Marshall, Jill A., Ph.D. (University of Oregon), M.S. (San Francisco State University), B.S. (California State University, Hayward), Assistant Professor, 2017.

Paradise, Thomas R., Ph.D. (Arizona State University), M.A. (Georgia State University), F.G.A., G.G. (Gemological Institute of America), B.S. (University of Nevada), University Professor, 2000.

Potra, Adriana, Ph.D. (Florida International University), M.S., B.S. (University of Babes-Bolyai, Romania), Associate Professor, 2012.

Sharman, Glenn R., Ph.D. (Stanford University), B.S. (Wheaton College), Associate Professor, 2017.

Shaw, John B., Ph.D. (University of Texas at Austin), B.A. (Oberlin College), Associate Professor, 2014.

Stahle, David William, Ph.D. (Arizona State University), M.A. (University of Arkansas), B.A. (University of Arizona), Distinguished Professor, 1982.

Suarez, Celina A., Ph.D. (University of Kansas), M.S. (Temple University), B.S. (Trinity University), Associate Professor, 2012.

Sui, Daniel, Ph.D. (University of Georgia), M.S., B.S. (Peking University), Distinguished Professor, 2018.

Tullis, Jason A., Ph.D., M.S. (University of South Carolina at Columbia), B.S. (Brigham Young University), Professor, 2004.

Courses

GEOS 5003. Seminar in Geography. 3 Hours.

Selected topics, the nature of which varies with the need. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

GEOS 5011. Colloquium. 1 Hour.

Weekly meetings of faculty, graduates, advanced students and guests to discuss research and trends in the field of geography. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

GEOS 5023. Technical and Proposal Writing for the Geosciences. 3 Hours.

Preparation of technical reports, research proposals, and manuscripts for publication in the area of geosciences. (Typically offered: Spring)

GEOS 5043. Foundations of Geospatial Data Analysis. 3 Hours.

Basic mathematical tools applied in geospatial technology, including trigonometry in mapping, linear algebra in remote sensing, optimization in spatial decision support, and graph theory in routing. Course develops the framework for spatial data analysis and decision support. Pre- or Corequisite: GEOS 5543. (Typically offered: Fall and Spring)

GEOS 5053. Quaternary Environments. 3 Hours.

An interdisciplinary study of the Quaternary Period, including dating methods, deposits, soils, climates, tectonics, and human adaptation. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with ANTH 5053, ENDY 5053.

GEOS 5073. Geospatial Technologies Computational Toolkit. 3 Hours.

Basic computational tools and processes applied in geospatial software, related computer hardware components, systems and applications software, and spatial database fundamentals. Python, including SciPy and NumPy, geospatial implementations will be emphasized. No programming experience is required. Pre- or Corequisite: GEOS 5543. (Typically offered: Fall and Spring)

GEOS 5083. Geospatial Data Mining. 3 Hours.

Basic tools for analyzing, summarizing and visualizing geospatial data. Exploratory data and spatial data analysis, probability distributions and application, single and multivariate analysis and hypothesis testing, and spatial smoothing and interpolation. Emphasis will be on problem solving in geospatial settings using the R statistical language. Prerequisite: GEOS 5043 and GEOS 5073 or equivalent. (Typically offered: Fall and Spring)

GEOS 5093. History and Philosophy of Geography. 3 Hours.

This course familiarizes students with the history of geography, the contributions of geographers to scientific thought and theory, and research techniques that are used in geography. Emphasis is given to the integration of statistical and spatial analysis, and their applications in field research. The course includes short field-based projects in and around Northwest Arkansas. (Typically offered: Spring Even Years)

GEOS 510V. Special Problems in Physical Geosciences. 1-6 Hour.

Special problems in Geosciences. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

GEOS 5113. Global Change. 3 Hours.

Examines central issues of global change including natural and human induced climate change, air pollution, deforestation, desertification, wetland loss urbanization, and the biodiversity crisis. The U.S. Global Change Research Program is also examined. (Typically offered: Fall)

This course is cross-listed with ENDY 5113.

GEOS 5123. Stratigraphic Principles and Practice. 3 Hours.

Physical and biological characteristics of sedimentary environments and their correlation in time with emphasis on the local geologic section. Corequisite: Lab component. Prerequisite: GEOS 4223 or GEOS 5323 (formerly GEOS 4223). (Typically offered: Irregular)

GEOS 5133. Radar Remote Sensing. 3 Hours.

Introduction to radar remote sensing and its applications in geology, geography, archeology, engineering, and agriculture. Focuses on Synthetic Aperture Radar (SAR) and advanced techniques including radar stereo, polarimetry, and interferometry. Covers Interferometric SAR (InSAR) for mapping topography and modeling Earth's surface motions due to earthquakes, volcanic eruptions, landslides, and subsidence. Prerequisite: GEOS 3023 or equivalent. (Typically offered: Spring)

GEOS 5143. 3D Seismic Exploration. 3 Hours.

(Formerly GEOS 4463.) Interpretation of 3D seismic data for geological structure, stratigraphy, and pore fluid variations with emphasis on hydrocarbon exploration. Credit will not be given for both GEOS 4463 and GEOS 5143. Prerequisite: GEOS 4433 or GEOS 5433 (formerly GEOS 4433). (Typically offered: Spring)

GEOS 5153. Environmental Site Assessment. 3 Hours.

Principles, problems, and methods related to conducting an environmental site assessment. An applied course covering field site assessment, regulatory documentation, and report preparation. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Irregular)

This course is cross-listed with ENDY 5153.

GEOS 5163. Hydrogeologic Modeling. 3 Hours.

Topics include numerical simulation of ground water flow, solute transport, aqueous geochemistry, theoretical development of equations, hypothesis testing of conceptual models, limitations of specific methods, and error analysis. Emphasis on practical applications and problem solving. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033) and computer literacy. (Typically offered: Irregular)

GEOS 5173. Urban Geography. 3 Hours.

(Formerly GEOS 4073.) Areal patterns of modern urban regions and the focus shaping these patterns. Emphasis is placed on American urban areas and their evolution and functional areas. Field work. Graduate degree credit will not be given for both GEOS 4073 and GEOS 5173. (Typically offered: Irregular)

GEOS 5183. Geography of the Middle East. 3 Hours.

(Formerly GEOS 4043.) Physical and cultural landscapes, natural and cultural resources, art and architecture, land use, political history, OPEC, and current problems of North Africa and the Middle East region west of Afghanistan are discussed. Class participation, discussions, slides and films, and student presentations will round out the class. Graduate degree credit will not be given for both GEOS 4043 and GEOS 5183. (Typically offered: Fall)

GEOS 5196. Advanced Field Methods of Applied Hydrogeology. 6 Hours.

Applied field course emphasizing collection and interpretation of ground water data. Three hours may be applied toward an M.S. degree in geology. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Summer)

GEOS 520V. Special Problems in Human Geography. 1-6 Hour.

Special problems in human geography. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

GEOS 5213. Principles of Remote Sensing. 3 Hours.

Fundamental concepts of remote sensing of the environment. Optical, infrared, microwave, LIDAR, and in situ sensor systems are introduced. Remote sensing of vegetation, water, urban landscapes, soils, minerals, and geomorphology is discussed. The course includes laboratory exercises in GIS software and field spectroscopy. (Typically offered: Fall)

GEOS 5223. Sedimentary Petrology. 3 Hours.

Sediments and sedimentary rocks. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: GEOS 4223 or GEOS 5323 (formerly GEOS 4223). (Typically offered: Fall)

GEOS 5233. Geography of Religion & Sacrality. 3 Hours.

Explores the spatial nature of the World's major faiths and religious institutions, focusing on the distribution and origins of these religions. Examines the religious beliefs, rituals, architecture, demographics, and art in different societies, cultures, and countries. Considers the tenets and practices of what is sacred and/or spiritual, held in common by a group or community. Prerequisite: Graduate standing. (Typically offered: Irregular)

GEOS 5243. Political Geography. 3 Hours.

(Formerly GEOS 4243.) Contemporary world political problems in their geographic context. Development of the principles of political geography with emphasis upon the problems of Eastern Europe, Africa, and Southeast Asia. Graduate degree credit will not be given for both GEOS 4243 and GEOS 5243. (Typically offered: Fall Odd Years)

GEOS 5253. Geomorphology. 3 Hours.

(Formerly GEOS 4053.) Mechanics of landform development. Lecture 2 hours, laboratory 3 hours per week. Several local field trips are required during the semester. Graduate degree credit will not be given for both GEOS 4053 and GEOS 5253. (Typically offered: Spring)

GEOS 5263. Hydrogeology. 3 Hours.

(Formerly GEOS 4033.) Occurrence, movement, and interaction of water with geologic and cultural features. Lecture 3 hours per week. Graduate degree credit will not be given for both GEOS 4033 and GEOS 5263. Corequisite: Lab component. Prerequisite: MATH 2043 or MATH 2554, and GEOS 3514. (Typically offered: Spring)

GEOS 5273. Principles of Geochemistry. 3 Hours.

(Formerly GEOS 4063.) Introduction to fundamental principles of geochemistry from historic development to modern concepts. Graduate degree credit will not be given for both GEOS 4063 and GEOS 5273. Corequisite: Lab component. Prerequisite: CHEM 1121L, CHEM 1123 and GEOS 2313. (Typically offered: Fall)

GEOS 5283. Economic Geology. 3 Hours.

(Formerly GEOS 4083.) Introduction to mineral deposits used as economic resources. Covers basic geology and geochemistry of mineral deposit formations and the formation of major classes of deposits. Examines the relationship between the distribution of ores, oil, gas, coal, and Plate Tectonics. Explores environmental issues associated with the extraction of earth resources. Graduate degree credit will not be given for both GEOS 4083 and GEOS 5283. Prerequisite: GEOS 2313. (Typically offered: Irregular)

GEOS 5293. Introduction to Global Positioning Systems and Global Navigation Satellite Systems. 3 Hours.

(Formerly GEOS 4593.) Fundamentals of navigation, mapping, and high-precision positioning using the Navstar Global Positioning System. Topics include datum definition and transformation, map projections, autonomous and differential positioning using both code and carrier processing, and analysis of errors. Graduate degree credit will not be given for both GEOS 4593 and GEOS 5293. (Typically offered: Fall)

This course is cross-listed with ANTH 5593.

GEOS 530V. Special Problems in Regional Geography. 1-6 Hour.

Special problems in regional geography. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

GEOS 5313. Planetary Atmospheres. 3 Hours.

Origins of planetary atmospheres, structures of atmospheres, climate evolution, dynamics of atmospheres, levels in the atmosphere, the upper atmosphere, escape of atmospheres, comparative planetology of atmospheres. (Typically offered: Irregular)

GEOS 5323. Stratigraphy and Sedimentation. 3 Hours.

(Formerly GEOS 4223.) Introductory investigation of stratigraphic and sedimentologic factors important to the study of sedimentary rocks. Lecture 2 hours, laboratory 3 hours per week. A required weekend, two-day field trip will be conducted during the semester. Graduate degree credit will not be given for both GEOS 4223 and GEOS 5323. Corequisite: Lab component. Prerequisite: GEOS 3413. (Typically offered: Fall)

GEOS 534V. Internship in Physical Geography. 3-6 Hour.

(Formerly GEOS 430V.) Supervised experience in municipal, county, state or private natural resource management agency, or any other such organization approved by instructor. Graduate degree credit will not be given for both GEOS 430V and GEOS 534V. (Typically offered: Fall, Spring and Summer)

GEOS 5353. Meteorology. 3 Hours.

(Formerly GEOS 4353.) Examination of the atmospheric processes that result in multifarious weather systems. Offered as physical science. Graduate degree credit will not be given for both GEOS 4353 and GEOS 5353. (Typically offered: Fall)

GEOS 5363. Climatology. 3 Hours.

(Formerly GEOS 4363.) Fundamentals of topical climatology followed by a study of regional climatology. Offered as physical science. Graduate degree credit will not be given for both GEOS 4363 and GEOS 5363. (Typically offered: Spring)

GEOS 537V. Geology Field Trip. 1-2 Hour.

(Formerly GEOS 437V.) Camping field trip to areas of geologic interest, usually conducted during Spring Break. Graduate degree credit will not be given for both GEOS 437V and GEOS 537V. Prerequisite: GEOS 3313. (Typically offered: Spring) May be repeated for up to 4 hours of degree credit.

GEOS 5383. Hazard & Disaster Assessment, Mitigation, Risk & Policy. 3 Hours.

(Formerly GEOS 4383.) Comprehensive introduction to interdisciplinary approaches to natural and environmental hazards and risk. Hazards and disaster assessment, mitigation, and policy are the focus of the class. Graduate degree credit will not be given for both GEOS 4383 and GEOS 5383. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

GEOS 5393. Mathematical Modeling of Geological Processes. 3 Hours.

This course explores a variety of topics in applied mathematics and computational methods within the context of studying geological processes and from the perspective of a modeling practitioner. Programming is conducted in Python. Knowledge of Calculus II is necessary. (Typically offered: Irregular)

GEOS 5403. American Public Lands and Policy. 3 Hours.

The course examines the role of American federal public lands in 19th-21st century geography, history, policy, and art. It investigates the growth of conservation, preservation, and management movements in the US by looking at America's national parks, forests, dams, wildlife refuges, wilderness areas, managed and agricultural lands. Prerequisite: Graduate standing. (Typically offered: Irregular)

GEOS 5423. Remote Sensing of Natural Resources. 3 Hours.

Introductory digital image processing of remotely sensed data. Topics include data collection, laboratory design, scientific visualization, radiometric and geometric correction, enhancement, pattern recognition, artificial intelligence, and change detection in natural resource remote sensing. GIS-based exercises and a course project are included. Prerequisite: GEOS 3213 or GEOS 5213. (Typically offered: Spring Even Years)

GEOS 5433. Geophysics. 3 Hours.

(Formerly GEOS 4433.) Derivation from physical principles, of the geophysical methods for mapping the Earth. Computational methods of converting gravity, magnetic, radiometric, electrical, and seismic data into geologic information. Lecture 3 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both GEOS 4433 and GEOS 5433. Corequisite: Lab component. Prerequisite: MATH 2564 and PHYS 2033 and PHYS 2031L and GEOS 3514. (Typically offered: Irregular)

GEOS 5443. The Solid Earth. 3 Hours.

Modern views for the origin of the solid Earth and its structure, composition, and evolution through geologic time. Topics will include examination of relevant geophysical and geochemical constraints used to develop global models for the Earth. Prerequisite: GEOS 3313, MATH 2564, CHEM 1123, PHYS 2074 or instructor consent. (Typically offered: Irregular)

GEOS 5453. Introduction to Raster GIS. 3 Hours.

(Formerly GEOS 4553.) Theory, data structure, algorithms, and techniques behind raster-based geographical information systems. Through laboratory exercises and lectures multidisciplinary applications are examined in database creation, remotely sensed data handling, elevation models, and resource models using boolean, map algebra, and other methods. Graduate degree credit will not be given for both GEOS 4553 and GEOS 5453. (Typically offered: Fall)

This course is cross-listed with ANTH 5553.

GEOS 5473. Applied Climatology. 3 Hours.

Applied climatology involves the use of climatic data to solve a variety of social, economic and environmental problems, such as for clients in agriculture, water and energy management. The basic purpose of applied climatology is to help society, at all scales and levels, to achieve a better adjustment to the climatic environment. (Typically offered: Fall)

GEOS 5483. Severe Weather. 3 Hours.

(Formerly GEOS 4483.) Focuses on the formation and impact of weather phenomena such as blizzards, floods, tornadoes, thunderstorms, hurricanes and droughts. Covers the mechanisms and physics that control severe weather, advanced terminology, physical concepts and scientific methods used in meteorology, and the analysis and interpretation of meteorological data. Graduate degree credit will not be given for both GEOS 4483 and GEOS 5483. (Typically offered: Spring)

GEOS 550V. Internship in GIS & Cartography. 3-6 Hour.

(Formerly GEOS 440V.) Supervised experience in GIS and/or cartographic applications with municipal, county, state, or private enterprises. Graduate degree credit will not be given for both GEOS 440V and GEOS 550V. (Typically offered: Spring and Summer) May be repeated for up to 6 hours of degree credit.

GEOS 5513. Introduction to GIS Programming. 3 Hours.

This course introduces fundamentals of GIS software engineering and offers hands-on tutorials in customized applications using Arc GIS through programming ArcObjects in VBA/VA.net environment. Topics covered include ArcObjects, different programming syntax and styles, and fundamental routines and functions in ArcGIS. After completing the course, students will have the capability develop customized ArcGIS applications. (Typically offered: Fall)

GEOS 5523. Cartographic Design & Production. 3 Hours.

(Formerly GEOS 4523.) This course addresses advanced cartographic concepts (i.e. visual hierarchy, aesthetics, image cognition) and production techniques as they relate to computer-assisted mapping. Students produce a variety of maps using Adobe Illustrator (CS 4-6) software to build a map portfolio. Field trips may be required. Graduate degree credit will not be given for both GEOS 4523 and GEOS 5523. (Typically offered: Spring)

GEOS 5533. Introduction to Petroleum Geophysics. 3 Hours.

(Formerly GEOS 4533.) Introduction to seismic wave propagation and petroleum seismology with particular emphasis on seismic events, elastic waves, and seismic survey design. Credit will not be given for both GEOS 4533 and GEOS 5533. Prerequisite: MATH 2564, PHYS 2033, and GEOS 3514 or consent of instructor. (Typically offered: Fall)

GEOS 5543. Geospatial Applications and Information Science. 3 Hours.

An introduction to the methods and theory underlying the full range of geographic information science and collateral areas - including GNSS, remote sensing, cadastral, spatial demographics and others. (Typically offered: Fall and Spring)

GEOS 5553. Spatial Analysis Using ArcGIS. 3 Hours.

Applications of analysis of spatial data using ArcGIS tools in map design, on-line mapping, creating geodatabases, accessing geospatial data, geo-processing, digitizing, geocoding, spatial analysis including basic spatial statistics, analysis of spatial distributions and patterning and 3D application using ArcGIS 3D Analyst. Prerequisite: GEOS 3543 or GEOS 5543. (Typically offered: Fall and Spring)

GEOS 5563. Tectonics. 3 Hours.

Development of ramifications of the plate tectonics theory. Analysis of the evolution of mountain belts. Lecture 3 hours per week. Prerequisite: GEOS 3514. (Typically offered: Fall)

GEOS 5573. Advanced Cartographic Techniques & Production. 3 Hours.

Covers advanced production and techniques in cartography, including animation, geospatial visualization, pochade, and advanced visualization. Emphasizes client relationships in creating and producing cartographic materials. Corequisite: Lab component. Prerequisite: GEOS 4523 or GEOS 5523. (Typically offered: Irregular)

GEOS 5583. Enterprise and Multiuser GIS. 3 Hours.

GIS practice that is typical of collaborative team-based geospatial organizations. Solve real-world problems through end-to-end GIS design and implementation using ArcGIS Enterprise, extensive federal, state, and local repositories, and high quality software documentation. Includes relevant training in geospatial provenance and metadata, and in enterprise and multiuser GIS administration. Introductory-level familiarity with GIS is recommended. (Typically offered: Spring)

GEOS 5593. Introduction to Geodatabases. 3 Hours.

Fundamental concepts and applications of geospatial databases. Schema development and spatial data models for geodata. Spatial and attribute query and optimization, properties and structures of relational and object-oriented geodatabases. Spatial extensions of SQL, spatial indexing, measurement, and geometry. Course will use PostGIS, ESRI File Geodatabases, and MS-SQL. Prerequisite: GEOS 3543 and GEOS 3103 or equivalent. (Typically offered: Fall and Spring)

GEOS 560V. Graduate Special Problems. 2-6 Hour.

Library, laboratory, or field research in different phases of geology. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

GEOS 5612. Research Methods in Geosciences. 2 Hours.

Survey of research methodologies used in both geology and geography, with an emphasis on quantitative analysis. Preparation of research proposals and presentations in the field of geosciences. Prerequisite: Graduate standing. (Typically offered: Fall)

GEOS 5653. GIS Analysis and Modeling. 3 Hours.

(Formerly GEOS 4653.) Unlike conventional GIS courses that focus on studying 'where', this course will teach students to address beyond 'where' using various GIS analysis and modeling techniques to explore 'why' and 'how'. The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. Graduate degree credit will not be given for both GEOS 4653 and GEOS 5653. (Typically offered: Spring)
This course is cross-listed with ANTH 5653, ENDY 5043.

GEOS 5663. Low-Temperature Geochemistry of Natural Waters. 3 Hours.

(Formerly GEOS 4663.) Covers the low-temperature geochemistry of waters and their associated minerals at Earth's surface. Examines the controls on the chemical composition of natural waters and the minerals precipitated from them. Topics covered will include water-rock interactions, pH, redox, the carbonate-water system, clay minerals and exchange, heavy metals, and a brief introduction to stable isotopes and geomicrobiology. Credit will not be given for both GEOS 4663 and GEOS 5663. Prerequisite: CHEM 1121L, CHEM 1123, GEOS 1113, and GEOS 1111L. (Typically offered: Fall)

GEOS 5673. Volcanology. 3 Hours.

A broad introduction to volcanic processes and their associated hazards. Emphasis will be placed on applying basic physical and chemical principles to understanding volcanic systems. Prerequisite: GEOS 2313. (Typically offered: Irregular)

GEOS 5693. Environmental Justice. 3 Hours.

(Formerly GEOS 4693.) This course deals with the ethical, environmental, legal, economic, and social implications of society's treatment of the poor, the disenfranchised, and minorities who live in the less desirable, deteriorating neighborhoods, communities, and niches of our country. The class integrates science with philosophy, politics, economics, policy, and law, drawing on award-winning films, current news, and case studies. Credit will not be given for both GEOS 4693 and GEOS 5693. (Typically offered: Spring)

GEOS 5713. Geology of Our National Parks. 3 Hours.

(Formerly GEOS 4563.) This course examines the underlying geology responsible for selected parks, and explores the interplay of geology, biology, climate, topography, and humans to evaluate the value of the parks, and to anticipate the problems they will face in the near and long-term. Credit will not be given for both GEOS 4563 and GEOS 5713. Prerequisite: GEOS 1113. (Typically offered: Fall)

GEOS 5743. Petroleum Geology. 3 Hours.

(Formerly GEOS 4253.) Distribution and origin of petroleum. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both GEOS 4253 and GEOS 5743. Corequisite: Lab component. Prerequisite: Admission to the Geology graduate program. (Typically offered: Fall)

GEOS 5753. Karst Hydrogeology. 3 Hours.

(Formerly GEOS 4153.) Assessment of ground water resources in carbonate rock terrains; relation of ground water and surface water hydrology to karst; quantification of extreme variability in karst environments; data collection rationale. Field trips required. Graduate degree credit will not be given for both GEOS 4153 and GEOS 5753. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Irregular)

GEOS 5783. Geography of Europe. 3 Hours.

(Formerly GEOS 4783.) Geographic regions of the area with emphasis on their present development. Graduate degree credit will not be given for both GEOS 4783 and GEOS 5783. (Typically offered: Irregular)

GEOS 5793. Geospatial Unmanned Aircraft Systems. 3 Hours.

Geospatial unmanned aircraft systems (UAS) are becoming key technologies in a number of disciplines. This course will introduce safe and legal operation of UAS in aerial photography, multispectral, thermal and LIDAR applications, geodetic control, photogrammetric and computer vision processing, and the creation of accurate 2D and 3D digital information products. Pre- or Corequisite: GEOS 3213 or GEOS 5213 (formerly GEOS 4413) and (GEOS 4593 or GEOS 5293 (formerly GEOS 4593)) or equivalent. (Typically offered: Fall)

GEOS 5853. Environmental Isotope Geochemistry. 3 Hours.

Introduction to principles of isotope fractionation and distribution in geologic environments, isotopic analytical methods, and extraction of isotope samples; application of isotopes in characterization of geologic processes and interaction with hydrologic, surficial, and biologic attenuation, paleothermometry soil, and biogeochemical processes. (Typically offered: Spring) May be repeated for up to 3 hours of degree credit.

This course is cross-listed with ENDY 5853.

GEOS 5863. Quantitative Techniques in Geosciences. 3 Hours.

(Formerly GEOS 4863.) An introduction to the application of standard quantitative and spatial statistical techniques to geoscientific analysis. Students will use both micro and large system computers in the course. Graduate degree credit will not be given for both GEOS 4863 and GEOS 5863. (Typically offered: Spring)

This course is cross-listed with ANTH 5863.

GEOS 5873. Geological Data Analysis. 3 Hours.

(Formerly GEOS 4873.) Quantitative methods and techniques for analysis and interpretation of geological data. Credit will not be given for both GEOS 4873 and GEOS 5873. Corequisite: Lab component. Prerequisite: MATH 2564 and GEOS 3514. (Typically offered: Spring)

GEOS 5893. Geography of Religion & Sacrality. 3 Hours.

Examines how the geographic and climatic environments shape and influence religious tradition. Considers the location of worship centers in a community and the world, as well as the geography within them. Studies the relationship between communal and sacred spaces. Explores religious pilgrimages and how migration affects religious practice. (Typically offered: Irregular)

GEOS 5924. Earth System History (ACTS Equivalency = PHSC 1104). 4 Hours.

(Formerly GEOS 4924.) Physical and biological events that form the history of the earth from its formation to the beginning of the historical era. Credit will not be given for both GEOS 4924 and GEOS 5924. Graduate enrollment only with departmental permission. Corequisite: Lab component. Prerequisite: GEOS 3514. (Typically offered: Spring)

GEOS 5933. Ancient Forest Science and Sustainability. 3 Hours.

Ancient forests preserve beautiful habitat with high ecological integrity. This course will examine the development, spatial distribution, and ongoing destruction of ancient forests worldwide, and how science can contribute to the understanding and sustainable management of these valuable resources. (Typically offered: Spring)

GEOS 5973. Seminar in Geoinformatics. 3 Hours.

Geographic information science and technology research topics of particular interest to the graduate student class. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

GEOS 5993. Dynamics of Sediment Transport. 3 Hours.

The course will give aspiring geologists and civil engineers tools for solving sedimentological problems in their fields. Starting from a grounding in fluid mechanics, we will learn how sediment is transported and stratigraphy accumulated. This will be applied to problems in sedimentology at all scales. (Typically offered: Fall Odd Years)

GEOS 600V. Master's Thesis. 1-6 Hour.

Master's thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

GEOS 700V. Doctoral Dissertation. 1-9 Hour.

Dissertation research. Prerequisite: Graduate standing and Ph.D. candidacy (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

German

See World Languages, Literatures, and Cultures (p. 328).

Health, Human Performance and Recreation (HHPR)

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Health, Human Performance and Recreation website (<http://hhpr.uark.edu/>)

Degrees Conferred:

M.A.T. in Athletic Training (p. 39) (ATTR)
 M.Ed. in Physical Education (p. 259) (PHED)
 M.Ed. in Recreation and Sport Management (p. 287) (RESM)
 M.S. in Exercise Science (<http://catalog.uark.edu/graduatecatalog/programsofstudy/kinesiologykinsmsphd/>) (EXSC)
 M.S., Ph.D. in Community Health Promotion (<http://catalog.uark.edu/graduatecatalog/programsofstudy/communityhealthpromotionchlpmsphd/>) (CHLP)
 Ph.D. in Health, Sport and Exercise Science (p. 158) (HSES)

Primary Areas of Faculty Research: Please see individual faculty bios for specific research interests.

Graduate Faculty

Bonacci, Jeff, D.A. (Middle Tennessee State University), M.S. (West Virginia University), B.S. (University of Akron), Clinical Associate Professor, 2000.
Calleja, Paul C., Ph.D., M.S. (University of Arkansas), B.S. (San Jose State University), Clinical Professor, 2003.
Davis, Robert, Ph.D., M.S., B.S. (University of Mississippi), Assistant Professor, 2018.
DiBrezza, Rosalie, Ph.D. (Texas Woman's University), M.S. (Indiana University), B.S. (Brooklyn College), University Professor, 1983.
Dittmore, Stephen W., Ph.D. (University of Louisville), M.A., B.A. (Drake University), Professor, 2008.
Dobbs, Page, Ph.D., M.S., B.S., (University of Arkansas), Assistant Professor, 2020.
Edmonston, Craig, M.S. (University of Kansas), B.S. (Kansas State University), Instructor, 2016.
Elbin, R. J., Ph.D. (Michigan State University), M.A., B.A. (University of New Orleans), Associate Professor, 2013.
Forbess, Janet B., M.Ed. (University of Florida), B.S.E. (Georgia Southern College), Instructor, 1978.
Gallagher, Kaitlin, Ph.D., B.Sc. (University of Waterloo, Canada), Assistant Professor, 2015.
Ganio, Matthew Stueck, Ph.D. (University of Connecticut), M.S., B.S. (University of Georgia), Professor, 2011.
Gorman, Dean Richard, Ph.D. (University of Kansas), M.S., B.A. (Arizona State University), Professor, 1979.
Gray, Michelle, Ph.D. (University of Arkansas), M.S. (Ball State University), B.S. (University of Tennessee, Chattanooga), Associate Professor, 2010.

Greene, Nicholas P., Ph.D. (Texas A&M University), M.S., B.S. (University of South Carolina), Associate Professor, 2013.
Hammig, Bart, Ph.D. (University of Kansas), M.P.H. (University of Kansas Medical Center), B.S. (University of Kansas), Professor, 2008.
Henry, Leah Jean, Ph.D. (Texas Woman's University), M.A. (Michigan State University), B.S. (Texas A&M University), Associate Professor, 2008.
Howie, Erin, Ph.D. (University of South Carolina), B.S. (University of Maryland), Assistant Professor, 2016.
Jones, Ches, Ph.D. (University of Alabama at Birmingham), B.S.E. (Pittsburg State University), Professor, 1994.
Jozkowski, Kristen N., Ph.D., M.S. (Indiana University at Bloomington), B.S. (Pennsylvania State University), Associate Professor, 2011.
Kern, Jack C., Ph.D. (Texas Woman's University), M.Ed. (Texas State University-San Marcos), B.S. (University of Wisconsin-LaCrosse), Clinical Professor, 1996.
Langsner, Steve, Ph.D. (Indiana University at Bloomington), M.S. (University of Baltimore), B.S. (Springfield College), Associate Professor, 1989.
Lens, Joshua, J.D. (University of Iowa), B.A. (University of Northern Iowa), Clinical Assistant Professor, 2018.
Lirgg, Cathy D., Ph.D. (Michigan State University), M.S. (Indiana State University), B.A. (Muskingum College), Professor, 1991.
McDermott, Brendon P., Ph.D. (University of Connecticut), M.S. (Indiana University at Bloomington), B.S. (Northeastern University), Associate Professor, 2012.
Moiseichik, Merry Lynn, J.D. (University of Arkansas), R.Ed. (Indiana University at Bloomington), M.S., B.S.E. (State University of New York at Cortland), Professor, 1989.
Ralph, Christy, M.A. (University of Arkansas), Instructor, 2019.
Russell, Alex, Ph.D. (Texas A & M University), M.A. (University of Houston), B.S. (University of Houston), Assistant Professor, 2020.
Schmitt, Abigail, Ph.D. (University of Florida), M.S. (University of Northern Colorado), B.S. (University of North Carolina), Assistant Professor, 2020.
Schmitt, Craig, Ph.D. (University of Northern Colorado), MBA (University of Central Florida), B.S. (University of Florida), Clinical Assistant Professor, 2020.
Smith-Nix, Angela, Ph.D. (University of Arkansas), M.Ed., B.S.E. (Arkansas State University), Clinical Assistant Professor, 1989.
Sullivan, Amanda Lynn, Ph.D., M.A.T., B.S.E. (University of Arkansas), Clinical Associate Professor, 2010.
Vandermark, Lesley, Ph.D., M.S. (University of Connecticut), B.S. (California University of Pennsylvania), Clinical Assistant Professor, 2016.
Washington, Tyrone A., Ph.D., B.S. (University of South Carolina at Columbia), Associate Professor, 2011.

Exercise Science Courses

EXSC 5023. Advanced Teaching in Exercise Science. 3 Hours.

Examination and practical exposure to the principles and practices of undergraduate teaching in exercise science. Includes course planning, teaching techniques, assessment strategies, and supervised practice. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EXSC 5323. Biomechanics I. 3 Hours.

Intended to serve as an introduction to biomechanics and focuses on scientific principles involved in understanding and analyzing human motion. (Typically offered: Fall)

EXSC 5333. Instrumentation in Biomechanics. 3 Hours.

The application of knowledge and skills necessary for data collection for sports analysis. Provides valuable information on instrumentation used specifically in biomechanics. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 5353. Exercise Psychology. 3 Hours.

Exercise Psychology is a lecture and discussion format for students interested in learning about theoretical and research information related to exercise adherence. (Typically offered: Fall)

EXSC 5443. Seminar in Brain Injury and Behavior. 3 Hours.

The Brain Injury and Behavior Seminar will immerse you in specific topics pertaining to the study of human brain-behavior relationships. Emphasis will be placed on traumatic brain injury (TBI), including moderate-to-severe injuries, as well as mild TBI or concussion. The first half of the course will focus on research related to how individuals sustain and recover from TBI. The second half of the course will focus on sports-related concussion in youth, collegiate, and professional athletes, with an emphasis on how athletes sustain concussions, how concussions are assessed, treated, and managed, and how return-to-play decision are made. This course will introduce you to research in a variety of fields that include physiology, neurology, and neuropsychology through primary source material in the form of book chapters and journal articles. (Typically offered: Irregular)

EXSC 5513. Physiology Exercise I. 3 Hours.

A study of the foundation literature in exercise physiology. Emphasis is placed on the muscular, cardiovascular, and respiratory systems. (Typically offered: Fall)

EXSC 5523. Muscle Metabolism in Exercise. 3 Hours.

A study of the metabolic changes that occur in muscle as a result of exercise, exercise training, and other stressors. Prerequisite: EXSC 5513 or equivalent. (Typically offered: Spring)

EXSC 5533. Cardiac Rehabilitation Program. 3 Hours.

An examination of the concepts, design, and implementation of cardiac rehabilitation programs. Emphasis on exercise programs but reference to nutrition, psychology, and other lifestyle interventions. (Typically offered: Spring Even Years)

EXSC 5543. Cardiovascular Function in Exercise. 3 Hours.

Study of the effects of exercise training and other stressors on the cardiovascular system. Detailed study of the components of the cardiovascular system and the responses and adaptations of those components to selected stimuli. Corequisite: EXSC 5513 or equivalent. (Typically offered: Fall Even Years)

EXSC 5593. Practicum in Laboratory Instrumentation. 3 Hours.

Practical experience in testing physical fitness utilizing laboratory equipment. Objective is to quantify physiological parameters, leading to the individualized exercise prescription. (Typically offered: Fall and Summer)

EXSC 5613. Physical Dimensions of Aging. 3 Hours.

This course will focus on the physiological changes with healthy aging, pathophysiology of age-related diseases, testing issues, exercise interventions, and the psychosocial aspects of aging. Prerequisite: EXSC 5513. (Typically offered: Spring Odd Years)

EXSC 5643. Advanced Psychology of Sports Injury and Rehabilitation. 3 Hours.

The purpose of this course is to explore and discuss factors related to the psychological aspects of athletic injuries. These factors include the sociocultural, mental, emotional, and physical dimensions of injury rehabilitation. (Typically offered: Spring)

EXSC 5773. Performance and Drugs. 3 Hours.

The pharmacological and physiological effects of ergogenic aids upon the athlete and performance coupled with the ethical and moralistic viewpoints of drug taking. Practical laboratory experiences are provided with pertinent statistical surveys of athletes; their drug taking habits and relevant psychological impact on performance. (Typically offered: Spring)

EXSC 6313. Muscle Physiology. 3 Hours.

To expand the student's knowledge of the skeletal muscle form and function. Specifically, how muscle is formed to how it can adapt as a post-mitotic tissue. This course will focus on the morphological, physiological, cellular, and molecular factors that affect skeletal muscle form and function. (Typically offered: Fall Even Years)

EXSC 6323. Biomechanics II. 3 Hours.

Analysis of human movement with emphasis on sports skills by application of principles of anatomy, kinesiology, and cinematographical analysis. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 6343. Physiology of Exercise II. 3 Hours.

Detailed study of the body systems affected by exercise, the functions of these systems during exercise, the effects of age, sex, body type, and nutrition on capacity for exercise, the techniques of assessing work capacity, and a critical analysis of research literature in this area. (Typically offered: Irregular)

EXSC 6443. Thermoregulation and Fluid Balance. 3 Hours.

Comprehensive overview of human thermoregulatory responses to exercise in heat and cold. (Typically offered: Spring Even Years)

Health, Human Performance and Recreation Courses

HHPR 5353. Research in Health, Human Performance and Recreation. 3 Hours.

Methods and techniques of research in health, human performance and recreation including an analysis of examples of their use and practice in their application to problems of interest to the student. (Typically offered: Fall, Spring and Summer)

HHPR 6233. Management in HHPR. 3 Hours.

Deals with principles, procedures, relationships, problems, and current practices in the supervision of health education and kinesiology. Includes management of facilities, programs, personnel, and processes. (Typically offered: Irregular)

HHPR 6333. Measurement in HHPR. 3 Hours.

Competencies for analysis and application of evaluation and measurement in HHPR. (Typically offered: Fall Odd Years)

HHPR 689V. Directed Research. 1-6 Hour.

Laboratory investigations, in basic and applied research. (Typically offered: Fall, Spring and Summer)

HHPR 699V. Seminar. 1-3 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HHPR 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Physical Education Courses

PHED 5243. Sport Skill Assessment and Instructional Strategies. 3 Hours.

The focus of this course is practical assessment techniques and instructional strategies in the area of sport and physical education activities. (Typically offered: Fall and Summer)

PHED 5253. The Physical Education Curriculum. 3 Hours.

Principles, problems, procedures, and the influence of educational philosophy on programs in physical education and their application in the construction of a course of study for a specific situation. (Typically offered: Fall and Summer)

PHED 5273. Professional Issues in Physical Education and Sport. 3 Hours.

A review of contemporary research literature informing effective teaching practices in physical education settings. Students gain experience in critically reviewing literature and discussing current issues. (Typically offered: Fall and Summer)

PHED 5313. Risk Management in Physical Education & Athletics. 3 Hours.

This course is designed to provide opportunities for the student to acquire an understanding of how to reduce the risk of injuries and eliminate hazards that may contribute to injuries associated with physical education and athletics. (Typically offered: Spring and Summer)

PHED 5483. Conducting Research in Physical Education. 3 Hours.

Methods and techniques of research in physical education, including an analysis of examples of their use and practice in their application to problems of interest to the student. Prerequisite: Students must be currently enrolled in the online MEd in Physical Education program. (Typically offered: Fall, Spring and Summer)

PHED 5553. Scientific Principles of Movement and Performance. 3 Hours.

This course focuses on theoretical information about sport biomechanics and movement principles, with practical applications to the physical education of coaching profession. (Typically offered: Spring and Summer)

PHED 5643. Motor Learning. 3 Hours.

Concepts of motor learning and control are presented. Attention is given to an analysis of the literature in movement control, motor behavior, and motor learning. (Typically offered: Fall and Spring)

PHED 5753. Sport Psychology. 3 Hours.

Investigation of historical and contemporary research in sport psychology. (Typically offered: Spring and Summer)

PHED 5803. Measurement Concepts for K-12 Physical Education Teachers. 3 Hours.

This course focuses on techniques that physical education teachers can use to monitor student progress in a K-12 environment. (Typically offered: Spring and Summer)

PHED 6363. Supervision in Physical Education. 3 Hours.

The focus of this course is instructional supervision as a set of complex processes in which the supervisor works within accepted guidelines and functions to effectively supervise a teacher's pedagogical development. The Physical Education Instructional Supervision (PEIS) Model will be used to help facilitate this process. (Typically offered: Fall and Spring)

PHED 6723. Project Implementation and Data Analysis. 3 Hours.

This course is designed to provide students with the tools to identify, develop, and submit grant proposals. (Typically offered: Fall and Spring)

Recreation and Sport Management Courses

RESM 5023. Outdoor Adventure Leadership. 3 Hours.

(Formerly RESM 4023.) This course considers the values and scope of outdoor recreation programs, leadership and skill development with practical experience in a wilderness environment. The course will include a canoe trip through the wilderness, and skill training in such areas as orienteering and rock climbing; and leadership development in interpersonal and processing skills. The graduate portion of the class is geared toward leading and trip planning for taking college age and older students into remote areas. Graduate degree credit will not be given for both RESM 4023 and RESM 5023. (Typically offered: Summer)

RESM 5273. The Intramural Sports Program. 3 Hours.

(Formerly RESM 4273.) Historical development, aim and objectives, organization, administration, units of competition, program of activities, schedule making, scoring plans, rules and regulations, awards, and special administrative problems. Graduate degree credit will not be given for both RESM 4273 and RESM 5273. (Typically offered: Fall Odd Years)

RESM 5283. History and Application of American Sport. 3 Hours.

This survey course will explore the historical development of sport in American culture and the processes of change in American culture and sport from the 15th century to the present. Students will learn how to apply historical concepts to current issues in recreation and sport management. (Typically offered: Irregular)

RESM 5293. Athletics and Higher Education. 3 Hours.

This course features an examination of the historical development of athletics within American institutions of higher learning with an emphasis upon concepts and ideals that underlie the developments and the major problems affecting contemporary intercollegiate athletics. The purpose of this course is to teach the learner about the development of intercollegiate athletics from the mid-19th century to today. A second purpose of this course is to examine the major issues facing sport administrators within intercollegiate athletics today. (Typically offered: Spring and Summer)

RESM 5333. Sport Media and Public Relations. 3 Hours.

The course will explore the relationship between media organizations and sport organizations, with an emphasis on the business of media rights, as well as public relations theories such as two-way symmetrical communication and agenda setting. Finally, the course will examine practical communication tactics employed by public relations practitioners such as image repair and crisis communications, and the issues presented by forms of new media. (Typically offered: Fall)

RESM 5463. Sports Facilities Management. 3 Hours.

Considers basic elements and procedures in the planning, design, construction, operation, and maintenance of sport facilities; management considerations in conducting various types of events. (Typically offered: Summer)

RESM 560V. Workshop. 1-3 Hour.

Workshop. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

RESM 574V. Internship. 1-3 Hour.

This experiential-based course requires 135 hours per semester of work in a recreation or sport setting. (Typically offered: Fall, Spring and Summer)

RESM 5813. Social Issues in Sport. 3 Hours.

Using sociological theories and scholarship to examine social and cultural influences on sport and physical activity. Course is based on a social justice framework and a cultural studies perspective. (Typically offered: Fall and Summer)

RESM 5833. Recreation and Sport for Special Populations. 3 Hours.

Skills, knowledge, and concepts within recreation and sport which are appropriate to planning and implementing recreation and sport programs and services for the handicapped. (Typically offered: Irregular)

RESM 5843. Tourism. 3 Hours.

Explores major concepts of tourism to discover what makes tourism work, how tourism is organized, and its social and economic effects. (Typically offered: Spring)

RESM 5853. Capstone in Recreation and Sport Management. 3 Hours.

Capstone course where students utilize program courses to solve administrative issues which may arise in an organization. Attention is given to how departmental organization, administrative practices and policies, strategic planning, personnel management, finances, and legal areas are integrated to create solutions to broad-based contemporary issues. (Typically offered: Spring)

RESM 5873. Leadership in Recreation and Sport Management Services. 3 Hours.

Considers research, theory, and practical applications of leadership principles utilized in the provision of recreation and sport management services. Focus is on motivation, attitude, communication, group dynamics, and problem solving. (Typically offered: Fall and Summer)

RESM 5883. Recreation and Sport Services Promotion. 3 Hours.

Examines specific strategies for promoting recreation and sport programs in the local community. (Typically offered: Summer)

RESM 5893. Public and Private Finance in Recreation and Sport Management. 3 Hours.

Develops an understanding of both public and private finance management for students in public and private management positions. Provides an understanding of the budgeting processes and techniques used in obtaining and controlling funds, including private sector finance problems in areas of credit, pricing, indexing, and debt management. (Typically offered: Fall)

RESM 600V. Master's Thesis. 1-18 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

RESM 605V. Independent Study. 1-3 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

RESM 612V. Directed Reading in Recreation and Sport. 1-3 Hour.

Critical analysis of literature in the area of recreation and sport. (Typically offered: Fall, Spring and Summer)

RESM 6133. Issues in RESM. 3 Hours.

A review of the significant social, demographic, behavioral, developmental, and technological issues that influence health, kinesiology, and recreation and sport management programs. Pre- or Corequisite: Doctoral level students only. (Typically offered: Irregular)

RESM 6533. Legal and Political Aspects. 3 Hours.

An overview of major legislation affecting recreation and sport management professions; how to operate within these laws; and methods for influencing new legislation. Also discusses political aspects of professions both outside and inside government agencies. (Typically offered: Spring)

RESM 674V. Internship. 1-3 Hour.

Students will learn diverse teaching techniques and implement them in an ongoing undergraduate recreation and sport management class serving as the teaching laboratory. The 'what' 'when' and 'how' relative to integrating various teaching techniques with specific content areas in the class will be explored by both the student and the instructor. (Typically offered: Fall, Spring and Summer)

Health, Sport and Exercise Science

Matthew S. Ganio
 Department Head
 306 HPER Building
 479-575-2857
 Email: msganio@uark.edu

Paul Calleja
 Assistant Department Head and Graduate Coordinator
 306C HPER Building
 479-575-2854
 Email: pcallej@uark.edu

Degree Offered:

Ph.D. in Health, Sport and Exercise Science (HSES)

The Ph.D. program in the Department of Health, Human Performance and Recreation is a research-focused degree that is designed to prepare scholars in advanced study to contribute to the field through teaching, research, and service.

The department is comprised of four divisions and offers the Ph.D. degree with a concentration in each corresponding program area:

1. Exercise Science
2. Health Behavior and Health Promotion
3. Kinesiology Pedagogy
4. Recreation and Sport Management

Ph.D. in Health, Sport and Exercise with Exercise Science Concentration

Admission to Ph.D. Degree Program:

The applicant must have 1) completed a master's degree or its equivalent in a field related to their specialization area to which they are applying, 2) meet general admission requirements of the Graduate School, 3) a GPA of at least 3.00 on all graduate course work; and 4) an acceptable score on the Graduate Record Examinations (GRE). Admission will be based on the willingness and ability of a graduate faculty member to accept a new student. Additional prerequisites may be prescribed after review of application materials.

Applications must include the following:

1. Curriculum vitae.
2. Statement of purpose and research interest, including specification of the area of concentration to which you are applying.
3. Academic transcripts
4. Three letters of recommendation

Requirements for the Doctor of Philosophy Degree:

A minimum of 60 graduate semester hours, including 18 hours of dissertation, is required after admission into the Ph.D. program. In the event required courses for the Ph.D. program have been taken during a student's master's degree program, they will need to substitute another graduate course in lieu of the required course. A doctoral advisory committee will be established by the student in consultation with the Coordinator of Graduate Study during the first semester of enrollment subsequent to acceptance into the degree program. The student, in conjunction with the advisory committee, will define the program of study. The degree program requires successful completion of qualifying examinations, dissertation, and an oral defense of the dissertation. These last requirements are described elsewhere in this catalog.

HHPR 5353	Research in Health, Human Performance and Recreation	3
ESRM 5393	Statistics in Education and Health Professions	3
HHPR 700V	Doctoral Dissertation	18
Research and Statistical Requirements		
A minimum of 18 hours approved by doctoral advisory committee.		18
Total Hours		42

Requirements also include the area of concentration presented below.

Requirements for Exercise Science Concentration:

Exercise Science Core

EXSC 5323	Biomechanics I	3
EXSC 5513	Physiology Exercise I	3
EXSC 5593	Practicum in Laboratory Instrumentation	3

Cognate

The student, in consultation with the doctoral advisory committee, will identify hours of further course work comprising a field of study in an area of interest. Course work may be selected from several related disciplines or a single discipline. 9

Electives

Students must complete 36 hours of graduate electives as approved by the doctoral advisory committee. 36

Total Hours 54

Ph.D. in Health, Sport and Exercise Science with Health Behavior and Health Promotion Concentration

Admission to Ph.D. Degree Program:

The applicant must have 1) completed a master's degree or its equivalent in a field related to their specialization area to which they are applying, 2) meet general admission requirements of the Graduate School, 3) a GPA of at least 3.00 on all graduate course work; and 4) an acceptable score on the Graduate Record Examinations (GRE). Admission will be based on the willingness and ability of a graduate faculty member to accept a new student. Additional prerequisites may be prescribed after review of application materials.

Applications must include the following:

1. Curriculum vitae.
2. Statement of purpose and research interest, including specification of the area of concentration to which you are applying.
3. Academic transcripts
4. Three letters of recommendation

Requirements for the Doctor of Philosophy Degree:

A minimum of 60 graduate semester hours, including 18 hours of dissertation, is required after admission into the Ph.D. program. In the event required courses for the Ph.D. program have been taken during a student's master's degree program, they will need to substitute another graduate course in lieu of the required course. A doctoral advisory committee will be established by the student in consultation with the Coordinator of Graduate Study during the first semester of enrollment subsequent to acceptance into the degree program. The student, in conjunction with the advisory committee, will define the program of study. The degree program requires successful completion of qualifying examinations, dissertation, and an oral defense of the dissertation. These last requirements are described elsewhere in this catalog.

HHPR 5353 Research in Health, Human Performance and Recreation 3

ESRM 5393 Statistics in Education and Health Professions 3

HHPR 700V Doctoral Dissertation 18

Research and Statistical Requirements

A minimum of 18 hours approved by doctoral advisory committee. 18

Total Hours 42

Requirements also include the area of concentration presented below.

Requirements for the Health Behavior and Health Promotion Concentration:

The Health Behavior and Health Promotion concentration trains health behavior researchers for academic positions in university settings, for

positions in federal health agencies such as the Centers for Disease Control and Prevention and the National Institutes of Health, and for post-doctoral research fellowships.

Health Behavior Core

PBHL 5533 Theories of Social and Behavioral Determinants of Health 3

PBHL 5563 Public Health: Practices and Planning 3

PBHL 5573 Principles of Health Education 3

PBHL 5613 Epidemiology 3

Cognate

The student, in consultation with the doctoral advisory committee, will identify hours of further course work comprising a field of study in an area of interest. Course work may be selected from several related disciplines or a single discipline. 6

Electives

Students must complete 36 hours of graduate electives as approved by the doctoral advisory committee. 36

Total Hours 54

Ph.D. in Health, Sport and Exercise Science with Kinesiology Pedagogy Concentration

Admission to Ph.D. Degree Program:

The applicant must have 1) completed a master's degree or its equivalent in a field related to their specialization area to which they are applying, 2) meet general admission requirements of the Graduate School, 3) a GPA of at least 3.00 on all graduate course work; and 4) an acceptable score on the Graduate Record Examinations (GRE). Admission will be based on the willingness and ability of a graduate faculty member to accept a new student. Additional prerequisites may be prescribed after review of application materials.

Applications must include the following:

1. Curriculum vitae.
2. Statement of purpose and research interest, including specification of the area of concentration to which you are applying.
3. Academic transcripts
4. Three letters of recommendation

Requirements for the Doctor of Philosophy Degree:

A minimum of 60 graduate semester hours, including 18 hours of dissertation, is required after admission into the Ph.D. program. In the event required courses for the Ph.D. program have been taken during a student's master's degree program, they will need to substitute another graduate course in lieu of the required course. A doctoral advisory committee will be established by the student in consultation with the Coordinator of Graduate Study during the first semester of enrollment subsequent to acceptance into the degree program. The student, in conjunction with the advisory committee, will define the program of study. The degree program requires successful completion of qualifying examinations, dissertation, and an oral defense of the dissertation. These last requirements are described elsewhere in this catalog.

HHPR 5353 Research in Health, Human Performance and Recreation 3

ESRM 5393 Statistics in Education and Health Professions 3

HHPR 700V Doctoral Dissertation 18

Research and Statistical Requirements	
A minimum of 18 hours approved by doctoral advisory committee.	18
Total Hours	42

Requirements also include the area of concentration presented below.

Requirements for the Kinesiology Pedagogy Concentration:

Pedagogy Core		
PHED 6363	Supervision in Physical Education	3
PHED 5253	The Physical Education Curriculum	3
PHED 5273	Professional Issues in Physical Education and Sport	3
Cognate		
A minimum of 6 hours approved by doctoral advisory committee.	6	
Electives		
The student, in consultation with the doctoral advisory committee, will identify further course work comprising a field of study in kinesiology and consistent with the goals and objectives of the student and institution. Course work may be selected from several related disciplines or a single discipline.	39	
Total Hours	54	

Ph.D. in Health, Sport and Exercise Science with Recreation and Sport Management Concentration

Admission to Ph.D. Degree Program:

The applicant must have 1) completed a master's degree or its equivalent in a field related to their specialization area to which they are applying, 2) meet general admission requirements of the Graduate School, 3) a GPA of at least 3.00 on all graduate course work; and 4) an acceptable score on the Graduate Record Examinations (GRE). Admission will be based on the willingness and ability of a graduate faculty member to accept a new student. Additional prerequisites may be prescribed after review of application materials.

Applications must include the following:

1. Curriculum vitae.
2. Statement of purpose and research interest, including specification of the area of concentration to which you are applying.
3. Academic transcripts
4. Three letters of recommendation

Requirements for the Doctor of Philosophy Degree:

A minimum of 60 graduate semester hours, including 18 hours of dissertation, is required after admission into the Ph.D. program. In the event required courses for the Ph.D. program have been taken during a student's master's degree program, they will need to substitute another graduate course in lieu of the required course. A doctoral advisory committee will be established by the student in consultation with the Coordinator of Graduate Study during the first semester of enrollment subsequent to acceptance into the degree program. The student, in conjunction with the advisory committee, will define the program of study. The degree program requires successful completion of qualifying examinations, dissertation, and an oral defense of the dissertation. These last requirements are described elsewhere in this catalog.

HHPR 5353	Research in Health, Human Performance and Recreation	3
ESRM 5393	Statistics in Education and Health Professions	3
HHPR 700V	Doctoral Dissertation	18

Research and Statistical Requirements	
A minimum of 18 hours approved by doctoral advisory committee.	18
Total Hours	42

Requirements also include the area of concentration presented below.

Requirements for the Recreation and Sport Management Concentration:

The Recreation and Sport Management concentration prepares students to become teachers, researchers, and leaders in the area of recreation, sport management and leisure in university settings.

Recreation and Sport Management Core		
RESM 612V	Directed Reading in Recreation and Sport	3
RESM 6133	Issues in RESM	3
HHPR 6233	Management in HHPR	3
Cognate		
The student, in consultation with the doctoral advisory committee, will identify hours of further course work comprising a field of study in an area of interest. Course work may be selected from several related disciplines or a single discipline.	9	
Electives		
Students must complete 36 hours of graduate electives as approved by the doctoral advisory committee.	36	
Total Hours	54	

Courses

- EXSC 5023. Advanced Teaching in Exercise Science. 3 Hours.**
Examination and practical exposure to the principles and practices of undergraduate teaching in exercise science. Includes course planning, teaching techniques, assessment strategies, and supervised practice. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.
- EXSC 5323. Biomechanics I. 3 Hours.**
Intended to serve as an introduction to biomechanics and focuses on scientific principles involved in understanding and analyzing human motion. (Typically offered: Fall)
- EXSC 5333. Instrumentation in Biomechanics. 3 Hours.**
The application of knowledge and skills necessary for data collection for sports analysis. Provides valuable information on instrumentation used specifically in biomechanics. Prerequisite: EXSC 5323. (Typically offered: Irregular)
- EXSC 5353. Exercise Psychology. 3 Hours.**
Exercise Psychology is a lecture and discussion format for students interested in learning about theoretical and research information related to exercise adherence. (Typically offered: Fall)

EXSC 5443. Seminar in Brain Injury and Behavior. 3 Hours.

The Brain Injury and Behavior Seminar will immerse you in specific topics pertaining to the study of human brain-behavior relationships. Emphasis will be placed on traumatic brain injury (TBI), including moderate-to-severe injuries, as well as mild TBI or concussion. The first half of the course will focus on research related to how individuals sustain and recover from TBI. The second half of the course will focus on sports-related concussion in youth, collegiate, and professional athletes, with an emphasis on how athletes sustain concussions, how concussions are assessed, treated, and managed, and how return-to-play decision are made. This course will introduce you to research in a variety of fields that include physiology, neurology, and neuropsychology through primary source material in the form of book chapters and journal articles. (Typically offered: Irregular)

EXSC 5513. Physiology Exercise I. 3 Hours.

A study of the foundation literature in exercise physiology. Emphasis is placed on the muscular, cardiovascular, and respiratory systems. (Typically offered: Fall)

EXSC 5523. Muscle Metabolism in Exercise. 3 Hours.

A study of the metabolic changes that occur in muscle as a result of exercise, exercise training, and other stressors. Prerequisite: EXSC 5513 or equivalent. (Typically offered: Spring)

EXSC 5533. Cardiac Rehabilitation Program. 3 Hours.

An examination of the concepts, design, and implementation of cardiac rehabilitation programs. Emphasis on exercise programs but reference to nutrition, psychology, and other lifestyle interventions. (Typically offered: Spring Even Years)

EXSC 5543. Cardiovascular Function in Exercise. 3 Hours.

Study of the effects of exercise training and other stressors on the cardiovascular system. Detailed study of the components of the cardiovascular system and the responses and adaptations of those components to selected stimuli. Corequisite: EXSC 5513 or equivalent. (Typically offered: Fall Even Years)

EXSC 5593. Practicum in Laboratory Instrumentation. 3 Hours.

Practical experience in testing physical fitness utilizing laboratory equipment. Objective is to quantify physiological parameters, leading to the individualized exercise prescription. (Typically offered: Fall and Summer)

EXSC 5613. Physical Dimensions of Aging. 3 Hours.

This course will focus on the physiological changes with healthy aging, pathophysiology of age-related diseases, testing issues, exercise interventions, and the psychosocial aspects of aging. Prerequisite: EXSC 5513. (Typically offered: Spring Odd Years)

EXSC 5643. Advanced Psychology of Sports Injury and Rehabilitation. 3 Hours.

The purpose of this course is to explore and discuss factors related to the psychological aspects of athletic injuries. These factors include the sociocultural, mental, emotional, and physical dimensions of injury rehabilitation. (Typically offered: Spring)

EXSC 5773. Performance and Drugs. 3 Hours.

The pharmacological and physiological effects of ergogenic aids upon the athlete and performance coupled with the ethical and moralistic viewpoints of drug taking. Practical laboratory experiences are provided with pertinent statistical surveys of athletes; their drug taking habits and relevant psychological impact on performance. (Typically offered: Spring)

EXSC 6313. Muscle Physiology. 3 Hours.

To expand the student's knowledge of the skeletal muscle form and function. Specifically, how muscle is formed to how it can adapt as a post-mitotic tissue. This course will focus on the morphological, physiological, cellular, and molecular factors that affect skeletal muscle form and function. (Typically offered: Fall Even Years)

EXSC 6323. Biomechanics II. 3 Hours.

Analysis of human movement with emphasis on sports skills by application of principles of anatomy, kinesiology, and cinematographical analysis. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 6343. Physiology of Exercise II. 3 Hours.

Detailed study of the body systems affected by exercise, the functions of these systems during exercise, the effects of age, sex, body type, and nutrition on capacity for exercise, the techniques of assessing work capacity, and a critical analysis of research literature in this area. (Typically offered: Irregular)

EXSC 6443. Thermoregulation and Fluid Balance. 3 Hours.

Comprehensive overview of human thermoregulatory responses to exercise in heat and cold. (Typically offered: Spring Even Years)

Higher Education (HIED)

Michael Hevel

Department Head, Rehabilitation, Human Resources and Communication Disorders

Ed.D. Program Coordinator

100 Graduate Education Building

479-575-4924

Email: hevel@uark.edu

Leslie Jo Shelton

M.Ed. Program Coordinator

116A Graduate Education Building

479-575-4873

Email: ljshelto@uark.edu

Degrees offered:

M.Ed., Ed.D. in Higher Education (HIED)

Program Description: The Higher Education program prepares students for professional competence, leadership, and service in two areas: administration (including student affairs work) and college teaching. Within these areas of specialization, practicing professionals as well as persons entering the higher education field, may pursue programs emphasizing community colleges, four-year colleges and universities, or state, regional, or national agencies.

Areas of Study: M.Ed. Program: Student affairs, and organization and administration. Ed.D. Program: Administration and faculty leadership.

M.Ed. in Higher Education

Admission Prerequisites for Master of Education Program: Formal admission to the Master's of Education (M.Ed.) degree in Higher Education requires prior admission to the University of Arkansas Graduate School, which requires a separate application process. Admission to the University of Arkansas Graduate School requires a minimum 3.0 cumulative GPA or a 3.0 GPA on the last 60 hours of course work attempted. Applicants who do not meet the GPA guideline may qualify for admission by special consideration after consulting with the program coordinator prior to applying for the program.

In addition, admission to the program requires (1) a completed Higher Education Master's program application form; (2) a statement of interest; (3) a current resume; (4) three supporting letters of recommendation; and (5) a writing sample demonstrating the applicant's best writing.

Requirements for the Master of Education Degree: (Minimum 33 hours.) The master's degree program in higher education provides academic preparation for persons who plan to seek entry level positions at the director or assistant director level in both two-year and four-year institutions for which a master's degree is appropriate preparation, including community colleges and technical colleges, liberal arts colleges, and four-year colleges and universities. Depending upon prior experience, graduates may expect to find employment in a wide variety of positions

in residence life, financial aid, career planning and placement, student activities, student union management, alumni affairs, development, public information, continuing education, financial management, human resources, and institutional research, or as adviser to fraternities and sororities, or minority students.

In combination with course work outside of Higher Education, students may prepare for positions in development and in other beginning level positions in post-secondary institutions and educational agencies.

M.Ed. Program Requirements

1. Completion of a minimum total of 33 graduate semester-hour credits.
2. Completion of the following required seven courses in Higher Education:

HIED 5003	Overview-American Higher Education	3
HIED 5033	Student Affairs in Higher Education	3
HIED 5043	Student Development in Higher Education	3
HIED 5083	History and Philosophy of Higher Education	3
HIED 5073	Management of Higher Education Institutions	3
HIED 5643	Reflective Practice in Higher Education and Student Affairs	3
HIED 6653	Legal Aspects of Higher Education	3
3. Three 3-hour adviser-approved Higher Education elective courses (9 credit hours total).
4. Electives in Higher Education may be selected from the following:

HIED 504V	Practicum in Higher Education	1-6
HIED 5053	The Community College	3
HIED 5063	Diversity in Higher Education	3
HIED 5103	Higher Education in International Contexts	3
HIED 574V	Internship	1-3
HIED 605V	Independent Study	1-6
HIED 6533	Assessment of Institutional Effectiveness in Higher Education	3
HIED 6663	Finance and Fiscal Management	3
HIED 6683	Governance and Policy Making in Higher Education	3
HIED 699V	Seminar	1-6

Other Higher Education courses, designed primarily for doctoral students, with instructor's approval
5. A minimum of 3 hours in research methods or statistics selected from the following: HIED 5093 Research in Higher Education and Student Affairs, ESRM 5013 Research Methods in Education, ESRM 5393 Statistics in Education and Health Professions or other equivalent course.
6. A cumulative grade point average of at least 3.00 on all course work for the degree. No grades below "C" will be accepted for graduate degree credit.
7. Satisfactory performance on a written comprehensive examination.
8. Students enrolled in the Higher Education Program should hold a graduate assistantship or be employed full-time in higher education or a related field (exceptions must be approved by faculty).

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ed.D. in Higher Education

Admission Prerequisites for the Doctor of Education Degree: Formal admission to the Doctor of Education (Ed.D.) degree in Higher Education requires:

1. Prior admission to the University of Arkansas Graduate School, which requires a separate application process;
2. A master's degree or approved equivalent (minimally, 30 hours of post-baccalaureate graduate work completed);
3. A cumulative grade-point average on all graduate work attempted of at least 3.25;
4. A satisfactory Millers Analogy Test (MAT) score or Graduate Record Examination (GRE) scores (test scores usually at the 50th percentile);
5. Relevant professional experience in the field of higher education or a closely related field;
6. A completed Higher Education Program Application for Admission Form;
7. A current resumé or vitae;
8. A statement of interest;
9. At least three references (using our forms);
10. A writing sample demonstrating the applicant's best writing;
11. A personal interview with a Higher Education faculty committee, which by majority vote decides admission. Completed application deadlines are October 15 for Spring admission and March 15 for Fall admission.

Ed.D. Program Requirements

Higher Education Foundation Core (15 hours)

HIED 5083	History and Philosophy of Higher Education	3
HIED 6423	Trends, Issues and Problems in Higher Education	3
HIED 6643	College Students in the United States	3
HIED 6653	Legal Aspects of Higher Education	3
HIED 6683	Governance and Policy Making in Higher Education	3

HIED Courses 15

Higher Education courses such as the following. Up to 6 credit hours of master's-level HIED courses or self directed HIED courses such as Practicum or Independent Study may be approved by the advisory committee.

HIED 6013	The Professoriate: Problems and Issues
HIED 6023	Introduction to the Study of Higher Education
HIED 6083	Management Skills for Effective Leadership
HIED 6093	Leading Change
HIED 6183	
HIED 6303	Advancement in Higher Education
HIED 6323	Design and Evaluation of College Teaching
HIED 6353	The College and University Presidency
HIED 6483	Strategic Enrollment Management
HIED 6533	Assessment of Institutional Effectiveness in Higher Education
HIED 6663	Finance and Fiscal Management
HIED 699V	Seminar

Research and Statistics

HIED 5093	Research in Higher Education and Student Affairs (or an equivalent course or waived by the student's advisory committee)	3
ESRM 6403	Educational Statistics and Data Processing (or an equivalent course approved by the student's advisory committee)	3
HIED 6693	Research Techniques in Higher Education	3
	Advanced research methods course (quantitative or qualitative) as approved by the student's advisory committee	3

Graduate Electives

Electives as needed to fulfill total graduate semester hours required. May include graduate hours completed as part of another graduate degree program as approved by the student's advisory committee.

Dissertation

HIED 700V	Doctoral Dissertation	18
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Completion of the following doctoral program requirements:

- Minimum of 96 total graduate semester credit hours that includes a minimum of 78 credit hours of post-baccalaureate graduate coursework and at least 18 credit hours of dissertation.
- For students with master's in higher education, a minimum of 42 graduate semester credit hours completed beyond master's at the University of Arkansas, including a minimum of 24 hours of post-master's higher education coursework and at least 18 semester credit hours of dissertation.
- Minimum grade point average of at least 3.25 on all course work presented as part of the degree program. No graduate degree credit will be granted for any course grades below "C."
- Satisfactory completion of all requirements governing the written and oral examinations for the candidacy examination, the dissertation, and the final oral dissertation defense.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Camargo, Elsa, Ph.D. (Virginia Polytechnic Institute and State University), M.A., B.A. (University of Illinois at Chicago), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2018.

Gearhart, G. David, Ed.D., J.D. (University of Arkansas), B.A. (Westminster College), Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 1998.

Hevel, Michael Stephen, Ph.D. (University of Iowa), M.A. (Bowling Green State University), B.A. (University of Kansas), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2012.

Mamiseishvili, Ketevan, Ph.D., M.A. (University of Missouri-Columbia), B.A. (Akaki Tsereteli State University), Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2008.

McCray, Suzanne, Ph.D. (University of Tennessee), M.A., B.A. (University of Arkansas), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2010.

Miller, Michael T., Ed.D. (University of Nebraska), M.S., B.A. (Southern Illinois University), Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2003.

Murry, John, Ed.D., J.D., M.B.A., B.S.B.A., B.S. (University of Arkansas), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 1993.

Shelton, Leslie Jo, Ph.D. (Michigan State University), M.Ed., B.A. (Ohio University), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2014.

Courses

HIED 5003. Overview-American Higher Education. 3 Hours.

A basic course in the study of higher education open to all students seeking careers in colleges and universities. Serves as an introduction to the programs, problems, issues, and trends in higher education. (Typically offered: Fall)

HIED 5033. Student Affairs in Higher Education. 3 Hours.

Study of origins, functions, and policies in student personnel services in contemporary 2- and 4-year colleges and universities with emphasis on the student and student development. (Typically offered: Fall)

HIED 5043. Student Development in Higher Education. 3 Hours.

Provides those who work or plan to work in post secondary educational institutions with an understanding of the student population in contemporary colleges and universities. (Typically offered: Spring)

HIED 504V. Practicum in Higher Education. 1-6 Hour.

Students are assigned to a department or agency within or outside the university for professional experience under the joint supervision of on-site personnel and university faculty. Periodic meetings are scheduled for evaluation, discussion, and examination of techniques. (Typically offered: Fall, Spring and Summer)

HIED 5053. The Community College. 3 Hours.

An overview of the community college. Topics include the history and philosophy of the community college movement, students, curriculum, state and local campus governance, teaching, student personnel work, finance and issues, problems, and trends. (Typically offered: Irregular)

HIED 5063. Diversity in Higher Education. 3 Hours.

Broadly explores how sociocultural contexts influence diversity at colleges and universities. Focuses on the responsibilities of higher education leaders to be multiculturally competent professionals who foster inclusive practices for diverse student populations. (Typically offered: Irregular)

HIED 5073. Management of Higher Education Institutions. 3 Hours.

Principles and concepts of management and their application in college and university settings. (Typically offered: Fall and Summer)

HIED 5083. History and Philosophy of Higher Education. 3 Hours.

An examination of the history and development of higher education including the study of the philosophy, objectives, and functions of various types of institutions. (Typically offered: Spring)

HIED 5093. Research in Higher Education and Student Affairs. 3 Hours.

This course provides master's students an overview of research and literature applicable to the discipline; teaches students how to understand academic literature and use empirical evidence to inform practices and policies at colleges and universities. Prerequisite: MEd students in the Higher Education Program. (Typically offered: Fall, Spring and Summer)

HIED 5103. Higher Education in International Contexts. 3 Hours.

Explores various systems of higher education around the world. Equips students with the knowledge and skills to work in the increasingly internationalized field of higher education. (Typically offered: Irregular)

HIED 5303. Non-Profit Fundraising. 3 Hours.

Non-Profit Fundraising examines the theory and practice of the professional field of fundraising and development, which is dedicated to attracting philanthropic support from constituents for colleges, universities, health organizations, hospitals, non-profit organizations, museums and other philanthropic endeavors. (Typically offered: Irregular)

HIED 5643. Reflective Practice in Higher Education and Student Affairs. 3 Hours.

Provides students an opportunity to work in a functional area of higher education, reflect on how their experiences inform their career goals as higher education professionals, and learn job search strategies in higher education. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HIED 574V. Internship. 1-3 Hour.

Supervised field experiences in student personnel services, college administration, academic advising, institutional research, development, or other areas of college and university work. (Typically offered: Fall, Spring and Summer)

HIED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIED 6013. The Professoriate: Problems and Issues. 3 Hours.

An examination of the vital issues and trends affecting college faculty personnel with emphasis upon institutional practices and policies. (Typically offered: Irregular)

HIED 6023. Introduction to the Study of Higher Education. 3 Hours.

A requirement for all new doctoral and specialist students. Familiarization with writing requirements, library search procedures, library resources, and program requirements. Prerequisite: Admission to Higher Education Ed.D program. (Typically offered: Irregular)

HIED 605V. Independent Study. 1-6 Hour.

Provides students with an opportunity to pursue special study in higher education. (Typically offered: Fall, Spring and Summer)

HIED 6083. Management Skills for Effective Leadership. 3 Hours.

Development of management skills that enhance leadership includes understanding yourself, managing yourself, team building, personnel selection, group and individual decision-making, problem solving, managing conflict, developing valid performance appraisal systems, conducting performance appraisal interview, and other topics of current interest. Prerequisite: Doctoral students in Higher Education or permission of the instructor. (Typically offered: Irregular)

HIED 6093. Leading Change. 3 Hours.

An in-depth examination of leadership, change, and culture in postsecondary education. (Typically offered: Irregular)

HIED 6303. Advancement in Higher Education. 3 Hours.

Advancement in Higher Education examines the theory and practice of the professional field and function referred to as 'institutional advancement', which is dedicated to attracting philanthropic support as well as building attitudinal and behavioral support among key constituents for colleges and universities. (Typically offered: Irregular)

HIED 6323. Design and Evaluation of College Teaching. 3 Hours.

Theory and practice of effective college teaching. Emphasis is placed on preparation and evaluation of instruction. (Typically offered: Irregular)

HIED 6343. Strategies for Effective College Teaching. 3 Hours.

An examination of traditional and innovative instructional strategies for use in college teaching. (Typically offered: Irregular)

HIED 6353. The College and University Presidency. 3 Hours.

The course explores the basic elements of the presidency of an academic institution and examines the critical issues facing the college and university presidents/chancellors. (Typically offered: Irregular)

HIED 6423. Trends, Issues and Problems in Higher Education. 3 Hours.

A study of the current problems and trends related to the field of higher education. (Typically offered: Irregular)

HIED 6483. Strategic Enrollment Management. 3 Hours.

An examination of admissions marketing strategies, communications plans, branding, and forecasting as well as how other areas (financial aid, honors, scholarships, and student affairs) contribute to successful recruitment efforts. Other key enrollment management areas of focus for the class include academic records, registration, degree audits, FERPA, student support, and most importantly, retention. Major state and federal legislation that underscores any of these activities will be discussed as well. (Typically offered: Irregular)

HIED 6533. Assessment of Institutional Effectiveness in Higher Education. 3 Hours.

The course examines the fundamentals of assessment of learning outcomes and institutional effectiveness and introduces assessment as a tool to inform strategic planning and data-driven decision-making in higher education. (Typically offered: Irregular)

HIED 6643. College Students in the United States. 3 Hours.

Students will engage with the leading theoretical and empirical scholarship related to college students and use this information to engage in class discussion, complete course assignments, consider implications for practice, and contemplate opportunities for new scholarship. Prerequisite: Doctoral student in the Higher Education Program or instructor consent. (Typically offered: Irregular)

HIED 6653. Legal Aspects of Higher Education. 3 Hours.

An examination of the legal status of higher education in the United States; the rights and responsibilities of educators and students including fair employment; due process; torts liability and contracts; student rights landmark court decisions; federal and state legislation having an impact on education. (Typically offered: Fall and Spring)

HIED 6663. Finance and Fiscal Management. 3 Hours.

Higher education finance and budgeting practices: problems, issues, trends, and policy issues in higher education. (Typically offered: Irregular)

HIED 6683. Governance and Policy Making in Higher Education. 3 Hours.

An analysis of governance and policy making affecting the control of colleges and universities. Attention is given to policy generation, governing board supervision, and the impact of institutional, professional, and regional groups as well as community, state, and federal pressures. (Typically offered: Irregular)

HIED 6693. Research Techniques in Higher Education. 3 Hours.

Techniques of research applicable to Higher Education. (Typically offered: Irregular)

HIED 674V. Internship. 1-6 Hour.

Supervised field experiences in student personnel services, college administration, college teaching, institutional research, development, or other areas of college and university work. (Typically offered: Fall, Spring and Summer)

HIED 699V. Seminar. 1-6 Hour.

A series of seminar for specialized study into areas of current significance in postsecondary education, such as leadership and planning; organization, development, and change; human resource development and appraisal; the student in higher education; etc. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

HIED 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

History (HIST)

James Gigantino
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Todd Cleveland

Associate Chair and Director of Graduate Studies
416 Old Main
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History Department website (http://fulbright.uark.edu/departments/history/index.php/grad_program/)

Degrees Conferred:

M.A., Ph.D. (HIST)

Prerequisites to Degree Program:

All prospective students are evaluated by the Graduate Studies Committee of the Department of History and are judged on a case-by-case basis, looking at a variety of factors including GPA, GRE scores, letters of recommendation, statement of purpose, and the appropriateness of our current faculty and other resources to student interests.

Graduate work at the master's level presupposes an undergraduate major in history of approximately 30 semester hours, although the Graduate Studies Committee will consider outstanding applicants with undergraduate degrees in related disciplines. In the past, strong applicants have presented at least an overall cumulative undergraduate grade point average of 3.0 or a grade point average of 3.25 in the last 60 hours of undergraduate work, a verbal score in the sixty-fifth percentile on the Graduate Record Examination (GRE) and an Analytical Writing score of 4.0 on the Graduate Record Examination (GRE). Students who present a minimum of 30 hours in history may be admitted without deficiency. Students who present between 18 and 30 hours of history may be admitted with or without deficiency, subject to the determination of the Graduate Studies Committee. Students who present less than 18 hours of history may not be admitted without deficiency. The Graduate Studies Committee will determine the nature of the deficiency requirements.

Applicants to the M.A. program in History must apply through the Graduate School. Students must submit a statement of purpose describing their goals in graduate study, a departmental application, a resume or CV, a writing sample, and three letters of recommendation. Master's applications are due February 1 each year. Details can be found on the departmental website.

Requirements for the Master of Arts Degree: Students seeking the Master of Arts degree must complete at least 30 hours of history at the 5000-level and above. These should include:

HIST 7023	Historical Methods	3
HIST 600V	Master's Thesis	6
7000-level seminar (research)		3
7000-level seminar courses (either reading or research)		9

Only three hours of independent study may be counted towards the degree. HIST 7043 Historiography can be substituted as a reading seminar to partially fulfill the seminar requirement. At least 9 of the 21 hours of seminars and electives must be in areas outside of the main field of specialization. Master's candidates must complete and satisfactorily defend a master's thesis in history as judged by a panel of departmental faculty. Students must maintain a minimum 3.0 GPA in all course work for the M.A. degree.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Prerequisites to the Degree Program: Graduate work at the doctoral level presupposes a Master of Arts in History, although the Graduate Studies Committee will consider outstanding applicants with master's degrees in related disciplines. Applicants without an M.A. degree but with exceptionally strong qualifications may be admitted directly into the Ph.D. program at the discretion of the Graduate Studies Committee. In the past, strong applicants have presented at least a 3.25 GPA in their previous graduate work as well as a verbal score in the 65th percentile on the Graduate Record Examination (GRE) and a 4.0 Analytical Writing score on the Graduate Record Examination (GRE).

Applicants to the Ph.D. program in History must apply through the Graduate School. Students must submit a statement of purpose describing their goals in graduate study, a departmental application, a resume or CV, three letters of recommendation, and a writing sample. Ph.D. applications are due December 1 each year. Details can be found on the departmental website.

Requirements for the Doctor of Philosophy Degree: During the first semester of study, all doctoral students will be assigned an advisory committee that will determine their particular programs. Students will select three fields of historical specialization including a minimum of 72 hours beyond the bachelor's degree and a minimum of 42 hours at the 5000-level or above beyond the master's degree. 18 hours of this minimum should be HIST 700V: Doctoral Dissertation.

Students will also be required to meet the departmental language requirement by establishing reading competency in at least one foreign language. At the discretion of the student's advisory committee, doctoral students may be required to prove reading competency in additional foreign languages if appropriate to their respective fields of research and study.

After completing the course of study prescribed by their advisory committees (with a minimum 3.0 GPA in all course work for the Ph.D. degree), satisfying the language requirements, and before the end of the third year of full-time study, doctoral students may apply to take the candidacy examinations. These consist of written exams in each of the three specialized fields and an oral examination. When these examinations have been passed, students may apply for admission to candidacy. Within six months of passing the written and oral exams, doctoral candidates will write and defend a dissertation prospectus.

All students must demonstrate a capacity for independent research by the writing of an original dissertation on a topic within their major area of study. Upon admission to candidacy, students will be assigned a dissertation committee with a major professor as chair to direct the research and writing. Under direction of the major professor, candidates will develop programs of reading in the general areas and research techniques pertinent to researching and writing their dissertations.

The student's final examination will be an oral defense of the dissertation.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

M.A. in History

Prerequisites to Degree Program:

All prospective students are evaluated by the Graduate Studies Committee of the Department of History and are judged on a case-by-case basis, looking at a variety of factors including GPA, GRE scores,

letters of recommendation, statement of purpose, and the appropriateness of our current faculty and other resources to student interests.

Graduate work at the master's level presupposes an undergraduate major in history of approximately 30 semester hours, although the Graduate Studies Committee will consider outstanding applicants with undergraduate degrees in related disciplines. In the past, strong applicants have presented at least an overall cumulative undergraduate grade point average of 3.0 or a grade point average of 3.25 in the last 60 hours of undergraduate work, a verbal score in the sixty-fifth percentile on the Graduate Record Examination (GRE) and an Analytical Writing score of 4.0 on the Graduate Record Examination (GRE). Students who present a minimum of 30 hours in history may be admitted without deficiency. Students who present between 18 and 30 hours of history may be admitted with or without deficiency, subject to the determination of the Graduate Studies Committee. Students who present less than 18 hours of history may not be admitted without deficiency. The Graduate Studies Committee will determine the nature of the deficiency requirements.

Applicants to the M.A. program in History must apply through the Graduate School. Students must submit a statement of purpose describing their goals in graduate study, a departmental application, a resume or CV, a writing sample, and three letters of recommendation. Master's applications are due February 1 each year. Details can be found on the departmental website.

Requirements for the Master of Arts Degree: Students seeking the Master of Arts degree must complete at least 30 hours of history at the 5000-level and above. These should include:

HIST 7023	Historical Methods	3
HIST 600V	Master's Thesis	6
7000-level seminar (research)		3
7000-level seminar courses (either reading or research)		9

Only three hours of independent study may be counted towards the degree. HIST 7043 Historiography can be substituted as a reading seminar to partially fulfill the seminar requirement. At least 9 of the 21 hours of seminars and electives must be in areas outside of the main field of specialization. Master's candidates must complete and satisfactorily defend a master's thesis in history as judged by a panel of departmental faculty. Students must maintain a minimum 3.0 GPA in all course work for the M.A. degree.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in History

Prerequisites to the Degree Program: Graduate work at the doctoral level presupposes a Master of Arts in History, although the Graduate Studies Committee will consider outstanding applicants with master's degrees in related disciplines. Applicants without an M.A. degree but with exceptionally strong qualifications may be admitted directly into the Ph.D. program at the discretion of the Graduate Studies Committee. In the past, strong applicants have presented at least a 3.25 GPA in their previous graduate work as well as a verbal score in the 65th percentile on the Graduate Record Examination (GRE) and a 4.0 Analytical Writing score on the Graduate Record Examination (GRE).

Applicants to the Ph.D. program in History must apply through the Graduate School. Students must submit a statement of purpose describing their goals in graduate study, a departmental application, a resume or CV, three letters of recommendation, and a writing sample.

Ph.D. applications are due December 1 each year. Details can be found on the departmental website.

Requirements for the Doctor of Philosophy Degree: During the first semester of study, all doctoral students will be assigned an advisory committee that will determine their particular programs. Students will select three fields of historical specialization including a minimum of 72 hours beyond the bachelor's degree and a minimum of 42 hours at the 5000-level or above beyond the master's degree. 18 hours of this minimum should be HIST 700V: Doctoral Dissertation.

Students will also be required to meet the departmental language requirement by establishing reading competency in at least one foreign language. At the discretion of the student's advisory committee, doctoral students may be required to prove reading competency in additional foreign languages if appropriate to their respective fields of research and study.

After completing the course of study prescribed by their advisory committees (with a minimum 3.0 GPA in all course work for the Ph.D. degree), satisfying the language requirements, and before the end of the third year of full-time study, doctoral students may apply to take the candidacy examinations. These consist of written exams in each of the three specialized fields and an oral examination. When these examinations have been passed, students may apply for admission to candidacy. Within six months of passing the written and oral exams, doctoral candidates will write and defend a dissertation prospectus.

All students must demonstrate a capacity for independent research by the writing of an original dissertation on a topic within their major area of study. Upon admission to candidacy, students will be assigned a dissertation committee with a major professor as chair to direct the research and writing. Under direction of the major professor, candidates will develop programs of reading in the general areas and research techniques pertinent to researching and writing their dissertations.

The student's final examination will be an oral defense of the dissertation.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Antov, Nikolay Atanasov, Ph.D. (University of Chicago), M.A. (Bilkent University, Turkey), B.A. (American University in Bulgaria), Associate Professor, 2011.

Austin, Shawn, Ph.D., M.A. (University of New Mexico), B.A. (Brigham Young University-Idaho), Assistant Professor, 2015.

Banton, Caree A., Ph.D. (Vanderbilt University), M.A. (University of Ghana), M.A. (University of New Orleans), B.A./B.P.A. (Grambling State University), Associate Professor, 2013.

Broggi, Alessandro, Ph.D. (Ohio University), Ph.D. (University of Florence, Italy), M.A. (Ohio University), B.A. (University of Florence, Italy), Professor, 2002.

Brubaker, Robert P., Ph.D. (University of Michigan-Ann Arbor), M.S. (University of Wisconsin-Milwaukee), B.A. (Grinnell College), Instructor, 2009.

Cleveland, Todd, Ph.D. (University of Minnesota), M.A., B.A. (University of New Hampshire), Associate Professor, 2015.

Coon, Lynda L., Ph.D., M.A. (University of Virginia), B.A. (James Madison University), Professor, 1990.

Domínguez, Freddy C., Ph.D., M.A. (Princeton University), B.A. (Brown University), Assistant Professor, 2014.

Gigantino, Jim, Ph.D. (University of Georgia), B.A. (University of Richmond), Professor, 2010.

Gordon, Joel Samuel, Ph.D. (University of Michigan-Ann Arbor), B.A. (University of Illinois), Professor, 1999.

Gordon, Ronald J., Ph.D. (University of Arkansas), Instructor, 2014.

Hammond, Kelly, Ph.D. (Georgetown University), M.A. (Simon Frazer University), B.A. (Bishop's University), Assistant Professor, 2015.

Hare, Laurence, Ph.D., M.A. (University of North Carolina at Chapel Hill), B.A. (University of Tennessee at Chattanooga), Associate Professor, 2010.

Muntz, Charles E., Ph.D. (Duke University), B.A. (Swarthmore College), Associate Professor, 2008.

Pepitone, Lauren, Ph.D., M.A. (Johns Hopkins University), B.A., Vassar University, Assistant Professor, 2016.

Pierce, Michael C., Ph.D., M.A. (The Ohio State University), B.A. (Kenyon College), Associate Professor, 2001.

Robinson, Charles F., Ph.D. (University of Houston), M.A. (Rice University), B.A. (University of Houston), Professor, 1999.

Rodriguez, Sarah, Ph.D., B.A. (University of Pennsylvania), Assistant Professor, 2016.

Rosales, Steven, Ph.D. (University of California-Irvine), B.A. (University of California-San Diego), Associate Professor, 2013.

Sloan, Kathryn Ann, Ph.D., M.A., M.B.A. (University of Kansas), B.A. (Kansas State University), Professor, 2004.

Sonn, Richard D., Ph.D., M.A. (University of California-Berkeley), B.A. (University of Michigan), Professor, 1987.

Starks, Trish, Ph.D., M.A. (The Ohio State University), B.A. (University of Missouri), Professor, 2000.

Sutherland, Daniel E., Ph.D., M.A., B.A. (Wayne State University), Distinguished Professor, 1989.

West, Elliott, Ph.D., M.A. (University of Colorado-Boulder), B.A. (University of Texas, Austin), Alumni Distinguished Professor, 1979.

Whayne, Jeannie, Ph.D., M.A., B.A. (University of California-San Diego), University Professor, 1990.

White, Calvin, Ph.D. (University of Mississippi), M.A., B.A. (University of Central Arkansas), Associate Professor, 2007.

Williams, Patrick George, Ph.D., M.A. (Columbia University), B.A. (University of Texas at Austin), Professor, 1998.

Woods, Randall B., Ph.D., M.A., B.A. (University of Texas at Austin), Distinguished Professor, 1971.

Courses

HIST 5003. Democratic Athens. 3 Hours.

(Formerly HIST 4003.) History of the Athens from the sixth century BCE to the end of the fourth. Topics include origins and evolution of democracy, the Persian wars, the rise and fall of the Athenian Empire, and the development of historiography, literature, art, and philosophy during the period. Graduate degree credit will not be given for both HIST 4003 and HIST 5003. (Typically offered: Irregular)

HIST 5013. Alexander the Great and the Hellenistic World. 3 Hours.

(Formerly HIST 4013.) A survey of the achievements of Alexander and the culture of the new world he created. The personality and career of Alexander are examined as well as the rich diversity of the Hellenistic world: trade with India, religious syncretism, and the development of Hellenistic science and philosophy. Graduate degree credit will not be given for both HIST 4013 and HIST 5013. (Typically offered: Irregular)

HIST 5033. Roman Empire. 3 Hours.

(Formerly HIST 4033.) History of Rome from the Emperor Augustus to Constantine, ca. 30 BCE - 337 CE. Topics include the sources for imperial Rome, the organization of imperial government, the provinces of Rome and provincial government, art and literature under the empire, the rise of Christianity, and the conversion of the Empire. Graduate degree credit will not be given for both HIST 4033 and HIST 5033. (Typically offered: Irregular)

HIST 506V. Readings in European History. 1-6 Hour.

Directed readings in the field of European history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 507V. Readings in American History. 1-6 Hour.

Readings. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 12 hours of degree credit.

HIST 511V. Research Problems in Latin American History. 1-6 Hour.

Research problems in Latin American history. (Typically offered: Irregular)

HIST 517V. Readings in Asian History. 1-6 Hour.

Readings. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 5193. Great Britain, 1901-2001. 3 Hours.

(Formerly HIST 4193.) Examines the history of the British Isles from the death of Queen Victoria in 1901 to the reelection of Prime Minister Tony Blair in 2001. Special attention is given to the collapse of the British Empire, the birth of the welfare state, and the challenges inherent in the decline of British world power. Graduate degree credit will not be given for both HIST 4193 and HIST 5193. (Typically offered: Spring Odd Years)

HIST 5203. History of the Holocaust. 3 Hours.

(Formerly HIST 4203.) Examines the origins, history, and legacies of the European Holocaust. Traces the origins of anti-Semitism in Europe, the rise of Nazism in Germany, the path to genocide during World War II, and the role of victims, perpetrators, rescuers, and bystanders. Considers issues of memory and justice in the postwar era. Graduate degree credit will not be given for both HIST 4203 and HIST 5203. (Typically offered: Irregular)

HIST 522V. Readings in Latin America History. 1-6 Hour.

Readings in Latin American history. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 524V. Readings in African History. 1-6 Hour.

Readings in African history. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 525V. Research Problems in African History. 1-6 Hour.

Research problems in African history. (Typically offered: Irregular)

HIST 526V. Readings in Middle Eastern History. 1-6 Hour.

Readings in Middle Eastern history. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 527V. Readings in Medieval History. 1-6 Hour.

Readings in Medieval history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 528V. Research Problems in Middle Eastern History. 1-6 Hour.

Research problems in Middle Eastern history. (Typically offered: Irregular)

HIST 530V. Readings in British History. 1-6 Hour.

Directed readings in the field of British history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 533V. Readings in Ancient History. 1-6 Hour.

Readings in Ancient history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 534V. Research Problems in Ancient History. 1-6 Hour.

Research problems in Ancient history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HIST 5393. Early Modern Islamic Empires, 1300-1750. 3 Hours.

(Formerly HIST 4393.) An examination of the historical development of the three great Islamic empires in the early modern period- the Ottomans, the Safavids of Iran, and the Mughals of India. Special attention given to imperial expansion, administrative structures, religious-legal establishment, and the formation of distinct traditions in political ideology, historiography, and the arts and sciences. Graduate degree credit will not be given for both HIST 4393 and HIST 5393. (Typically offered: Spring Odd Years)

HIST 5403. Islam in Asia. 3 Hours.

(Formerly HIST 4403.) Introduces students to the history of Islam in East and Southeast Asia over the past 1,200 years. It focuses on the 18th-21st centuries when Muslims were part of everyday life in Asia and participated in the formation of majority and minority identities in the region. Graduate degree credit will not be given for both HIST 4403 and HIST 5403. (Typically offered: Irregular)

HIST 545V. Readings in Caribbean History. 1-6 Hour.

Graduate readings in Caribbean history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 546V. Research Problems in Caribbean History. 1-6 Hour.

Independent research in Caribbean history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HIST 547V. Readings in Atlantic History. 1-6 Hour.

Graduate readings in Atlantic world history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 5483. African American Biographies. 3 Hours.

(Formerly HIST 4483.) Introduction to the history and intellectual development of famous and not-so-famous African Americans. Graduate degree credit will not be given for both HIST 4483 and HIST 5483. (Typically offered: Irregular)

HIST 5493. Religion in America to 1860. 3 Hours.

(Formerly HIST 4493.) History of religion in early America, primarily from a social and cultural perspective. Topics will include region, social class, growth of institutions, slavery, print culture, and social reform in traditions including Protestantism, West African religion, Catholicism, Native American religion, and Judaism. Graduate degree credit will not be given for both HIST 4493 and HIST 5493. (Typically offered: Irregular)

HIST 5503. History of Political Parties in the United States, 1789-1896. 3 Hours.

(Formerly HIST 4503.) Origin and development of the American party system from the implementation of the constitution to the election of McKinley. Graduate degree credit will not be given for both HIST 4503 and HIST 5503. (Typically offered: Fall Even Years)

HIST 5513. History of Political Parties in the United States Since 1896. 3 Hours.

(Formerly HIST 4513.) Response of the party system to America's emergence as an industrial nation and world power from the election of 1896 to present. Graduate degree credit will not be given for both HIST 4513 and HIST 5513. (Typically offered: Spring Odd Years)

HIST 5523. Roman Republic. 3 Hours.

(Formerly HIST 4023.) History of Rome from its origins in the eighth century BCE to the fall of the Republic in the first century BCE. Topics include the sources for Roman history, the development, functioning, and ultimate failure of republican government, the Roman army, and Roman imperialism in Italy and the Mediterranean. Graduate degree credit will not be given for both HIST 4023 and HIST 5523. (Typically offered: Irregular)

HIST 5543. American Social and Intellectual History Since 1865. 3 Hours.

(Formerly HIST 4543.) Survey of thought and society since the Civil War. Graduate degree credit will not be given for both HIST 4543 and HIST 5543. (Typically offered: Irregular)

HIST 5563. The Old South, 1607-1865. 3 Hours.

(Formerly HIST 4563.) Survey of the political, social, and economic development of the antebellum South. Graduate degree credit will not be given for both HIST 4563 and HIST 5563. (Typically offered: Fall Odd Years)

HIST 5573. The New South, 1860 to the Present. 3 Hours.

(Formerly HIST 4573.) Survey of the development of the Civil War and postwar South to the present. Graduate degree credit will not be given for both HIST 4573 and HIST 5573. (Typically offered: Fall Even Years)

HIST 5583. Arkansas in the Nation. 3 Hours.

(Formerly HIST 4583.) Designed to provide advanced undergraduate and graduate students with a comprehensive understanding of the full sweep of Arkansas history. The focus will be on social, economic and political history, and historiography. Graduate degree credit will not be given for both HIST 4583 and HIST 5583. (Typically offered: Irregular)

HIST 5593. The Colonial French in the Mississippi Valley. 3 Hours.

(Formerly HIST 4593.) This course focuses on the French Colonial Mississippi Valley from 1698 until 1763. Activities for both French and non-French speaking students provide a rich environment to discuss encounters, subsistence strategies, and warfare faced by native peoples, missionaries, explorers, and colonists alike. Students will examine primary handwritten, transcribed, or translated sources. Graduate degree credit will not be given for both HIST 4593 and HIST 5593. (Typically offered: Spring)

HIST 5603. U.S. Labor History to 1877. 3 Hours.

(Formerly HIST 4603.) Examines the changing nature of work in U.S. history from 1607 until 1877 including the ways that workers--individually and collectively--understand the meanings of their labor and to the ways that notions of class, gender, ethnicity, and race inform these understandings. Graduate degree credit will not be given for both HIST 4603 and HIST 5603. (Typically offered: Fall Odd Years)

HIST 5613. Colonial America 1600-1763. 3 Hours.

(Formerly HIST 4613.) History of colonial America from 1600 to the end of the Seven Years War emphasizing economic, social, and cultural perspectives. Topics include Native American, French, Spanish, English, Dutch, and Russian interactions in North America and the larger Atlantic World. Graduate degree credit will not be given for both HIST 4613 and HIST 5613. (Typically offered: Irregular)

HIST 5623. Revolutionary America, 1763 to 1789. 3 Hours.

(Formerly HIST 4623.) History of revolutionary America emphasizing economic, social, and cultural perspectives. Topics include historical interpretations of the causes of the war, the impact of war on African Americans, women, loyalists, elite, and poor Americans. The course also examines the formation of the new national government. Graduate degree credit will not be given for both HIST 4623 and HIST 5623. (Typically offered: Irregular)

HIST 5643. Early American Republic, 1789-1828. 3 Hours.

(Formerly HIST 4643.) History of the early United States emphasizing social and cultural perspectives. Topics addressed will include westward expansion, slavery, religion, and economic change. Graduate degree credit will not be given for both HIST 4643 and HIST 5643. (Typically offered: Irregular)

HIST 5653. Antebellum America, 1828-1850. 3 Hours.

(Formerly HIST 4653.) History of antebellum U.S. emphasizing social and cultural perspectives. Topics addressed will include slavery, religion, gender, the market economy, regionalism, and political developments. Graduate degree credit will not be given for both HIST 4653 and HIST 5653. (Typically offered: Irregular)

HIST 5663. Rebellion to Reconstruction, 1850-1877. 3 Hours.

(Formerly HIST 4663.) A survey of political, social, and economic issues from the late antebellum period through Reconstruction. Emphasis is placed on the causes of the Civil War and the problems of postwar America. A brief examination of the Civil War is included. Graduate degree credit will not be given for both HIST 4663 and HIST 5663. (Typically offered: Irregular)

HIST 5673. The American Civil War. 3 Hours.

(Formerly HIST 4673.) An intensive study of the political, social, military, and economic aspects of the American Civil War period. Graduate degree credit will not be given for both HIST 4673 and HIST 5673. (Typically offered: Fall)

HIST 5683. The American Civil Rights Movement. 3 Hours.

(Formerly HIST 4383.) Introduction to the history and development of the civil rights movement in the United States. Graduate degree credit will not be given for both HIST 4383 and HIST 5683. (Typically offered: Irregular)

HIST 5693. Late Middle Ages. 3 Hours.

(Formerly HIST 4053.) This course examines the political, social-economic, intellectual, and spiritual developments of European history, c. 1000-1400 CE. Special topics include monasticism, sacral kingship, the crusades, and the medieval university. Graduate degree credit will not be given for both HIST 4053 and HIST 5693. (Typically offered: Spring Odd Years)

HIST 570V. Special Topics. 1-6 Hour.

Special topics. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

HIST 5723. America Between the Wars, 1917-1941. 3 Hours.

(Formerly HIST 4723.) The impact of World War I, the 1920s, and the Great Depression upon American society and culture. Graduate degree credit will not be given for both HIST 4723 and HIST 5723. (Typically offered: Irregular)

HIST 573V. Readings in Global History. 1-6 Hour.

Directed readings in the field of Global history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 5753. Diplomatic History of the United States, 1776-1900. 3 Hours.

(Formerly HIST 4753.) Survey of American foreign relations from the American Revolution through the Spanish-American War. Principal topics include isolationism, freedom of the seas, manifest destiny and continental expansion, overseas expansion, and the diplomacy of war and peace. Emphasis on the relationship between domestic politics and foreign affairs. Graduate degree credit will not be given for both HIST 4753 and HIST 5753. (Typically offered: Fall Even Years)

HIST 5763. Diplomatic History of the United States, 1900-1945. 3 Hours.

(Formerly HIST 4763.) America's development as a world power. The course examines U.S. relations with Europe, Latin America, and East Asia, plus America's first approach to the Middle East. Particular emphasis is placed on America's involvement in World War I and World War II. Graduate degree credit will not be given for both HIST 4763 and HIST 5763. (Typically offered: Spring Odd Years)

HIST 5773. Diplomatic History of the US, 1945 to Present. 3 Hours.

(Formerly HIST 4773.) U.S. involvement in world affairs since WWII. The Cold War from an international perspective, including strategies, nuclear deterrence, conflicts, economic developments, cultural relations among allies and adversaries. Post-Cold War scenarios, including war on terrorism. Graduate degree credit will not be given for both HIST 4773 and HIST 5773. (Typically offered: Fall Odd Years)

HIST 5783. History of Modern Mexico. 3 Hours.

(Formerly HIST 4783.) This course examines the history of Mexico from the wars of independence to the present. Emphasis will be placed on the turbulent nineteenth century and the Mexican Revolution. Themes covered include colonial legacies, national identities, popular culture, emigration, and relations with the United States. Graduate degree credit will not be given for both HIST 4783 and HIST 5783. (Typically offered: Irregular)

HIST 5793. Colonial India, 1758-1948. 3 Hours.

(Formerly HIST 4793.) Examines the course of Indian history from the 1758 Battle of Plassey to eventual independence from Great Britain in 1948. Special attention is given to India's place within the British Empire, particularly the East India Company, the Indian Mutiny, the Raj, the rise of Gandhi, and India's independence movement. Graduate degree credit will not be given for both HIST 4793 and HIST 5793. (Typically offered: Irregular)

HIST 5803. Modern Scandinavia. 3 Hours.

(Formerly HIST 4803.) Examines the history of the Nordic lands, including Denmark, Finland, Iceland, Norway, and Sweden, from 1500 to the present. Graduate degree credit will not be given for both HIST 4803 and HIST 5803. (Typically offered: Irregular)

HIST 5813. Africans and Slavery in Colonial Latin America. 3 Hours.

(Formerly HIST 4813.) Explores the diverse experiences of slaves and free Blacks in colonial Spanish and Portuguese America from 1500 to around 1888, demonstrating that bondage and the practice of African slavery was a pillar of political authority in colonial Latin America. Graduate degree credit will not be given for both HIST 4813 and HIST 5813. (Typically offered: Irregular)

HIST 5823. Black Freedom in the Age of Emancipation. 3 Hours.

(Formerly HIST 4823.) This course centers on the comparative study of Atlantic World freedom movements from the perspective of the African Diaspora. It focuses on the histories, meanings, legacies of the various types of black emancipation in the Atlantic World and the cultural technologies that enabled them. Graduate degree credit will not be given for both HIST 4823 and HIST 5823. (Typically offered: Spring)

HIST 5833. Social and Cultural History of the Modern Middle East. 3 Hours.

(Formerly HIST 4433.) An analysis of Middle East history in the 17th-20th centuries which focuses on the social transformation of urban and rural life. Particular emphasis is given to the roles of economics, genealogy, art, and popular culture. Graduate degree credit will not be given for both HIST 4433 and HIST 5833. (Typically offered: Irregular)

HIST 5843. The Atlantic World, 1400-1850. 3 Hours.

(Formerly HIST 4233.) Explores the political, economic, cultural, and social engagement of Africans, Europeans, and Native Americans across the Atlantic from 1400 to 1850. It uses a comparative lens to understand how interactions between Europe, Africa, and the Americas created enduring ties throughout the Atlantic Basin. Graduate degree credit will not be given for both HIST 4233 and HIST 5843. (Typically offered: Irregular)

HIST 5873. Germany since 1945. 3 Hours.

(Formerly HIST 4873.) Examines the history of Germany since the end of the Second World War including political division and economic recovery, dissident movements in East Germany and alternative cultures in West Germany, reunification in 1990, and the legacy of Nazism and the Holocaust. Graduate degree credit will not be given for both HIST 4873 and HIST 5873. (Typically offered: Irregular)

HIST 5883. Health and Disease: 1500 to the Present. 3 Hours.

(Formerly HIST 4883.) Explores the emergence of epidemics against the backdrop of the nation state and anxieties over women, the lower classes, and other marginalized groups. The rise of modern health programs illuminates the cultural construction of medicine, the biases of scientific inquiry, and the tensions among paternalism, liberty, and prejudice. Graduate degree credit will not be given for both HIST 4883 and HIST 5883. (Typically offered: Irregular)

HIST 5893. Germany, 1918-1945. 3 Hours.

(Formerly HIST 4253.) Study of German history from advent of the Weimar Republic to the end of the Third Reich with emphasis upon the failure of democratic government in the 1920s and the rise and fall of the National Socialist dictatorship. Graduate degree credit will not be given for both HIST 4253 and HIST 5893. (Typically offered: Irregular)

HIST 5943. U.S. Labor History, from 1877-present. 3 Hours.

(Formerly HIST 4943.) This course will examine the changing nature of work in U.S. history from 1877 until the present. It will pay particular attention to the ways that workers--individually and collectively--understand the meanings of their labor and to the ways that notions of class, gender, ethnicity, and race inform these understandings. Graduate degree credit will not be given for both HIST 4943 and HIST 5943. (Typically offered: Spring Even Years)

HIST 5963. Third World Underdevelopment and Modernization. 3 Hours.

(Formerly HIST 4963.) Examines key issues related to societal change in the Third World, including various views and theories of international development and modernization. Other major issues explored include social inequalities, food and hunger, population, environment, trade and globalization, international aid, and the roles of state, market, and civil society. Graduate degree credit will not be given for both HIST 4963 and HIST 5963. (Typically offered: Irregular)

HIST 5973. The Civilization of the Renaissance in Italy. 3 Hours.

Important trends in Italian culture between the 14th and 16th centuries, including the birth of humanism, new understandings of the past, 'new' political ideologies, scientific innovation, and famous art produced in the Western tradition. (Typically offered: Irregular)

HIST 5983. Intellectual History of Europe Since the Enlightenment. 3 Hours.

(Formerly HIST 4143.) A survey of the major developments in European thought and culture since the emergence of Romanticism. Topics include Romanticism, Darwinism, Marxism, and Modernism. Graduate degree credit will not be given for both HIST 4143 and HIST 5983. (Typically offered: Fall Even Years)

HIST 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIST 6013. The Era of the French Revolution. 3 Hours.

(Formerly HIST 4213.) France from the salons of the Enlightenment to the Napoleonic Wars. The French Revolution will be explored in terms of politics and personalities, ideas and symbols, class and gender relations, and violence and terror. Graduate degree credit will not be given for both HIST 4213 and HIST 6013. (Typically offered: Fall Odd Years)

HIST 6033. Society and Gender in Modern Europe. 3 Hours.

(Formerly HIST 4133.) Changing values and attitudes toward childhood, family life, sexuality, and gender roles in Europe from the Renaissance to the present. The social impact of the Industrial Revolution, urbanization, demographic change, and the two world wars. Graduate degree credit will not be given for both HIST 4133 and HIST 6033. (Typically offered: Spring Odd Years)

HIST 6063. Tudor-Stuart England, 1485-1714. 3 Hours.

(Formerly HIST 4163.) Examines the history of the British Isles from the ascension of Henry VII and the Tudor dynasty until the close of the Stuart Era in 1714. Special attention is given to the English Reformation, the Elizabethan years, the 17th Century Revolutions, and the birth of an overseas Empire. Graduate degree credit will not be given for both HIST 4163 and HIST 6063. (Typically offered: Spring Even Years)

HIST 6073. Renaissance and Reformation, 1300-1600. 3 Hours.

(Formerly HIST 4073.) Examines the history of Europe from the end of the Middle Ages through the Renaissance to the Reformation and Counter-Reformation. Special attention is paid to changes in popular piety, political thought, religious representation, and the discovery of the New World. Graduate degree credit will not be given for both HIST 4073 and HIST 6073. (Typically offered: Fall Even Years)

HIST 6083. Early Modern Europe, 1600-1800. 3 Hours.

(Formerly HIST 4083.) Begins with the upheaval of the reformation, moves through the crisis of the 17th century and culminates with the democratic revolution of the 18th century. Examines the consolidation of the European state system, the propagation of modern science, discovery of overseas worlds, and the advent of the Industrial Revolution. Graduate degree credit will not be given for both HIST 4083 and HIST 6083. (Typically offered: Spring Odd Years)

HIST 6093. The History of African Americans and Social Justice. 3 Hours.

(Formerly HIST 4093.) Explores how the United States has extended social justice to African Americans during the nation's history. Examines social justice for blacks and the impact of historic policies and practices on black life today. Graduate degree credit will not be given for both HIST 4093 and HIST 6093. (Typically offered: Irregular)

HIST 6113. Archaic Greece. 3 Hours.

(Formerly HIST 4113.) History of Greece from the late Bronze Age to the end of the Persian Wars. This class will focus particularly on the sources involved with reconstructing early Greek history, especially Herodotus and Homer, on the development of the Greek city-state or polis, and on the interaction between the Greeks and Near-eastern civilizations during this period, culminating in the wars between the Greeks and the Persian Empire. Graduate degree credit will not be given for both HIST 4113 and HIST 6113. (Typically offered: Irregular)

HIST 6173. The Latin American City. 3 Hours.

(Formerly HIST 4173.) This course examines the social, political, and cultural aspects of the modern Latin American city from an interdisciplinary perspective. The course includes an introduction to urban studies concepts, and each semester is organized around a specific set of case studies. Graduate degree credit will not be given for both HIST 4173 and HIST 6173. (Typically offered: Irregular)

HIST 6183. Great Britain 1707-1901. 3 Hours.

(Formerly HIST 4183.) Examines the history of the British Isles from the 1707 Act of Union between Scotland and England until the death of Queen Victoria in 1901. Special attention is given to the spread of Empire, industrialization, and the political, social, and cultural aspects of the Georgian and Victorian Eras. Graduate degree credit will not be given for both HIST 4183 and HIST 6183. (Typically offered: Fall Even Years)

HIST 6203. Byzantine Empire. 3 Hours.

(Formerly HIST 4103.) Examines the history and culture of the Byzantine Empire from the reign of Constantine I to the fall of Constantinople in 1453. Topics include the development of Christianity and the schism with the western church, the crusades, and Byzantine influence on Islam, Russia, the Ottomans, and the Renaissance. Graduate degree credit will not be given for both HIST 4103 and HIST 6203. (Typically offered: Irregular)

HIST 6223. France Since 1815. 3 Hours.

(Formerly HIST 4223.) Survey of French history from the overthrow of Napoleon to the 5th Republic, with emphasis on French politics, society, and culture. Graduate degree credit will not be given for both HIST 4223 and HIST 6223. (Typically offered: Spring Even Years)

HIST 6243. Germany, 1789-1918. 3 Hours.

(Formerly HIST 4243.) Study of German history from the Age of Absolutism to the collapse of the German Empire at the end of the First World War. Special attention is paid to the Enlightenment and Romantic movements; nationalism and the unification of Germany; and evolving conflicts over the political and social order. Graduate degree credit will not be given for both HIST 4243 and HIST 6243. (Typically offered: Irregular)

HIST 6263. Independence and Africa Today. 3 Hours.

(Formerly HIST 4263.) Examines the last half-century of Africa's history, focusing on the last few decades. Introduction of Africa's colonial past, revolutions and struggles for independence. Review of African development in the post-colonial and contemporary era, successes and failures of independent Africa, and the challenges the continent faces today. Graduate degree credit will not be given for both HIST 4263 and HIST 6263. (Typically offered: Spring)

HIST 6273. Comparative Slavery. 3 Hours.

(Formerly HIST 4273.) Explores the meaning of slavery around the world, both in ancient and modern times. This examination of how slavery differed in various cultures over time will allow students to explore the complexity of this labor relationship and gain a better understanding of how slavery was an integral part of world history. Graduate degree credit will not be given for both HIST 4273 and HIST 6273. (Typically offered: Irregular)

HIST 6293. Latin American Environmental History. 3 Hours.

Explores the challenges, debates, and ecologies of Latin America in order to understand the historical roots of current environmental crises. It engages a historiography on ecosystems found in the region. Uses environmental history texts and scholarly articles to build a layered and transnational approach. (Typically offered: Irregular)

HIST 6303. Transatlantic Relations, 1919-Present. 3 Hours.

(Formerly HIST 4303.) US-Western European Relations, from the Wilsonian era to the present, covering strategic, economic, and cultural aspects. Graduate degree credit will not be given for both HIST 4303 and HIST 6303. (Typically offered: Irregular)

HIST 6333. Modern Islamic Thought. 3 Hours.

(Formerly HIST 4333.) Main currents in Islamic theology and political philosophy from the Ottoman Empire to the end of the twentieth century. Graduate degree credit will not be given for both HIST 4333 and HIST 6333. (Typically offered: Irregular)

HIST 6343. Golden Age Portugal and Spain. 3 Hours.

(Formerly HIST 4343.) This course will examine the diverging and converging paths of Portugal and Spain during the early modern period (15th-17th centuries). We will chart their rise as global imperial powers and their initial declines. We'll explore the political, social, and religious contexts in which Golden Age Iberia flourished. Graduate degree credit will not be given for both HIST 4343 and HIST 6343. (Typically offered: Irregular)

HIST 6463. The American Frontier. 3 Hours.

(Formerly HIST 4463.) American westward expansion and its influence on national institutions and character. Emphasis on the pioneer family and the frontier's role in shaping American society, culture, economy, and politics. Topics include exploration, the fur trade, the cattle kingdom and the mining, farming, and military frontiers. Graduate degree credit will not be given for both HIST 4463 and HIST 6463. (Typically offered: Fall Odd Years)

HIST 6473. Environmental History. 3 Hours.

(Formerly HIST 4473.) Examines the interactions between human culture and the natural environments: Concepts of nature in the West and elsewhere, dynamics of the Physical Environment, case studies in Regional Environmental History and the Politics of Environmental movements. Graduate degree credit will not be given for both HIST 4473 and HIST 6473. (Typically offered: Irregular)

HIST 6513. New Women in the Middle East. 3 Hours.

(Formerly HIST 4413.) This course covers the transformation of social and cultural roles of women in the Middle East since the 19th Century. Emphases include political emancipation, religious reformation, artistic representation, and gendered re-definition. Graduate degree credit will not be given for both HIST 4413 and HIST 6513. (Typically offered: Irregular)

HIST 6523. Wars of Religion: From the Crusades to 9/11. 3 Hours.

(Formerly HIST 4323.) Examines the place of religion in combat across the centuries. A case study approach is used to explore different conflicts from the twelfth century crusades against Muslim forces to 9/11. Investigates how religious motivations may or may not be related to other political, social, cultural, economic concerns. Graduate degree credit will not be given for both HIST 4323 and HIST 6523. (Typically offered: Irregular)

HIST 6543. Late Antiquity and the Early Middle Ages. 3 Hours.

(Formerly HIST 4043.) This course examines the political, spiritual, intellectual, and social-economic developments of European history, c. 300-1000 CE. Special topics include the Christianization of the late Roman Empire and Byzantium, as well as the formation of Celtic and Germanic Kingdoms in the West. Graduate degree credit will not be given for both HIST 4043 and HIST 6543. (Typically offered: Fall Even Years)

HIST 6563. The Middle East since 1914. 3 Hours.

(Formerly HIST 4363.) Middle East since 1914 addresses European colonialism, the rise of new social elites, independence, revolution, globalization, economic self-determination, persistent regional conflicts and ongoing battles over 'cultural authenticity'. Graduate degree credit will not be given for both HIST 4363 and HIST 6563. (Typically offered: Irregular)

HIST 6623. Africa and the Trans-Atlantic Slave Trade. 3 Hours.

(Formerly HIST 4123.) Examines the trans-Atlantic slave trade with a primary focus on the role of Africa and Africans in creating the unique economy and culture of the trans-Atlantic world. Graduate degree credit will not be given for both HIST 4123 and HIST 6623. (Typically offered: Irregular)

HIST 6643. Frontiers and Borderlands in Colonial Latin America. 3 Hours.

(Formerly HIST 4443.) This course examines frontiers and borderlands in colonial Latin America and focuses on the regions of California, New Mexico, Texas, Brazil, and the Río de la Plata. It demonstrates that frontiers and borderlands are defined by the absence of a hegemonic European power and associated with the prevalence of Indigenous norms. Graduate degree credit will not be given for both HIST 4443 and HIST 6643. (Typically offered: Irregular)

HIST 6703. Emergence of Modern America, 1876-1917. 3 Hours.

(Formerly HIST 4703.) A survey of the impact of the Industrial Revolution, Imperialism, and progressivism upon American life and institutions. Graduate degree credit will not be given for both HIST 4703 and HIST 6703. (Typically offered: Fall Odd Years)

HIST 6733. Recent America, 1941 to the Present. 3 Hours.

(Formerly HIST 4733.) A general survey of American history since World War II with emphasis upon the presidency, reform movements, the Cold War, and cultural developments. Graduate degree credit will not be given for both HIST 4733 and HIST 6733. (Typically offered: Irregular)

HIST 6743. The Cold War in Latin America: Revolutions, Violence, and Politics. 3 Hours.

(Formerly HIST 4743.) This course will trace the rise of the ideological and political struggles over social and economic development and the security regimes designed to thwart socialist revolution and political mobilization. The influence of the United States in Latin American security regimes and 'containment' activities will receive special attention. Graduate degree credit will not be given for both HIST 4743 and HIST 6743. (Typically offered: Irregular)

HIST 6843. Global History of Soccer. 3 Hours.

Prompts students to explore the various historical processes related to the global diffusion of and engagement with soccer. Examines the ways soccer has reflected the broader, ongoing process of globalization, with players, ideas, tactics, and wealth circulating throughout the globe. (Typically offered: Irregular)

HIST 6993. History of the Ottoman Empire, 1300-1923. 3 Hours.

History of the Ottoman Empire from its emergence as frontier principality in Anatolia ca. 1300, through its heyday as a major imperial power on three continents in the fifteenth through the eighteenth centuries, ending with its encounter with western imperialism and nationalism in the nineteenth and early twentieth centuries. (Typically offered: Irregular)

HIST 700V. Doctoral Dissertation. 1-18 Hour.

Independent research and writing leading to the completion of a doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIST 7023. Historical Methods. 3 Hours.

Practical introduction to historical research and writing. Consists of lecture, library reading, and class criticism of research papers. Prerequisite: Graduate standing. (Typically offered: Fall)

HIST 7043. Historiography. 3 Hours.

Survey of the history of historical writing and a study of the important schools and historical interpretation. Prerequisite: Graduate standing. (Typically offered: Irregular)

HIST 7053. Reading Seminar in Asian History. 3 Hours.

Concentrated reading in selected specialized areas of Asian history. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7103. Reading Seminar in American History. 3 Hours.

Historiographical and bibliographical study of special areas of U.S. history, such as Antebellum America, the Civil War, etc. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7123. Research Seminar in History. 3 Hours.

Research projects in selected fields of history, such as political history, gender history, history of race, etc. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7133. Reading Seminar in European History. 3 Hours.

Historiographical and bibliographical study of special periods in European history, such as the Roman Empire, the late Middle Ages, the French Revolution, etc. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7153. Reading Seminar in British History. 3 Hours.

Historiographical and bibliographical study of selected periods of British history. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7213. Reading Seminar in Middle Eastern History. 3 Hours.

Historiographical and bibliographical study of special areas of Middle Eastern history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7313. Reading Seminar in Latin American History. 3 Hours.

Historiographical and bibliographical study of special areas in Latin American history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7353. Reading Seminar in Medieval History. 3 Hours.

Historiographical and bibliographical study of special areas in medieval history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7373. Reading Seminar in Ancient History. 3 Hours.

Historiographical and bibliographical study of special areas in ancient history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7413. Reading Seminar in African History. 3 Hours.

Historiographical and bibliographical study of selected periods and/or topics in African history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7433. Reading Seminar in Caribbean History. 3 Hours.

Historiographical and bibliographical study of special areas in Caribbean history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7453. Reading Seminar in Global History. 3 Hours.

Graduate seminar adopting global perspectives on Europe, US, Asia, Africa, Latin America. Decentering narratives focusing on regional approaches, the course examines the global implications of various historical developments. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Horticulture (HORT)

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Department of Horticulture Website (<http://Hort.uark.edu>)

Degree Conferred:

M.S. in Horticulture (HORT)
Ph.D. in Agricultural, Food and Life Sciences with concentration in Horticulture (AFLS)

The Department of Horticulture offers a thesis and non-thesis option for the M.S. degree. The non-thesis program was developed for continued and advanced education in horticulture management. The program is directed toward students entering careers in horticulture upon completion of the degree, or students requiring additional education for advancement in their careers.

Related doctoral programs are offered by the Dale Bumpers College of Agricultural, Food and Life Sciences, which offers a Ph.D. degree with a concentration in Horticulture, and by the Department of Plant Science, which offers a Ph.D. in plant science with concentrations available in horticulture or plant pathology.

Genetics and plant breeding of fruit, vegetable, or ornamental crops; physiology, management and production of fruit, vegetable, greenhouse, or ornamental crops and landscape plantings; physiology and management of turfgrasses; and biotechnology.

M.S. in Horticulture

Prerequisites to Master of Science Degree Program (Thesis Option):

A candidate must have a B.S. degree from an accredited institution with a background in physical and biological sciences, horticulture, and supporting agricultural disciplines. The student will work with a major adviser, who will arrange a committee to evaluate the student's background and plan a program of study with the student.

Requirements for the Master of Science Degree (Thesis Option): A minimum of 24 semester hours of graduate level course work and 6 hours of thesis are required, in addition to any deficiency courses that may be specified. The student's advisory committee will also serve as the thesis and oral examination committee.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Prerequisites to Master of Science Degree Program (Non-thesis Option): Students seeking to pursue the non-thesis option must meet all admission criteria for the UA Graduate School. Applicants should have completed a B.S. or B.A. degree and have had course work in plant sciences, biology, botany, horticulture, or three years of experience in a plant science related career. Additionally, students seeking admission into the M.S. non-thesis option must submit three letters of reference regarding academic and professional experiences and potential. No professional examinations are required for admission.

Requirements for the Master of Science Degree (Non-thesis Option): A minimum of 30 hours of graduate course work as approved by the student's academic advising committee and within the requirements prescribed below. Specific Degree Requirements follow:

HORT 503V	Special Problems Research	1-6
HORT 5001	Seminar	1
Nine hours of HORT courses		9
BIOL 4303	Plant Physiology	3
AGST 5023	Principles of Experimentation	3
	or AGST 5014 Experimental Design	

1. Horticulture Block – A minimum of 20-21 hours including:
2. Plant and Agricultural Science Block – A minimum of 8-9 hours including: Course work in BIOL, CSES, AGST, PLPA, PTSC, ENTO, AGECE, AGME, AGED, LARC, or HORT.
3. Students must pass a written and oral examination to be given by their advising committee upon completion of their course work and submission of special project.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

The Ph.D. program in plant science is an interdepartmental program involving the Departments of Horticulture and Plant Pathology. The dissertation and most of the course work may be completed in horticulture. Find out more in the Ph.D. requirements in Plant Science (<http://catalog.uark.edu/graduatecatalog/programsofstudy/plantsciencetsc/>).

Requirements for Ph.D. in AFLS with Horticulture Concentration

Prerequisites to Degree Program: A Master of Science degree is desirable. A student with a Bachelor of Science and an exceptional record in academics and/or research may be approved for admission to the Ph.D. program in Agricultural, Food and Life Sciences if the Graduate Student Concentration Admissions Committee of the desired concentration deems them qualified and approval is granted by the AFLSPH Steering Committee. A student admitted to the University of Arkansas, pursuing an M.S. and in good academic standing may apply to be admitted to the doctoral program and forgo completing the M.S. degree if so approved by the AFLSPH Steering Committee and the AFLSPH Graduate Concentration Admissions Committee. A minimum grade point average of 3.00 (on a 4.00 scale) on previous college-level course work is required.

Admission Requirements for Entry: To be considered for admission, a student must submit a letter of intent, along with the application for admission indicating the desired degree concentration, areas of interest

and career goals. Official transcripts of all previous college-level course work must be submitted. Three letters of recommendation are required. These letters should address the character and academic capability of the applicant. Applications will first be reviewed by the AFLSPH Steering Committee which will assign the student to the appropriate Graduate Student Concentration Admissions Committee for review. The Concentration Admissions Committee will make the final determination of admittance into the AFLSPH program and the concentration.

Requirements for Doctor of Philosophy Degree: The Ph.D. program in Agricultural, Food and Life Sciences requires a minimum of 72 credit hours after a Bachelor of Science or Bachelor of Arts degree or a minimum of 42 hours after a Master of Science or Master of Arts degree.

General course requirements for each degree candidate are arranged on an individual basis by the Faculty Adviser, the Graduate Advisory Committee and the candidate in accordance with guidelines of their concentration. Alternate courses may be selected at the discretion of the committee.

All students must complete 6 hours of elective course hours and 2 hours of seminar. One seminar must be a research proposal presentation and the other must be an exit seminar presenting the dissertation research results. All students must complete 18 hours of doctoral dissertation hours. Students entering the doctoral program with only a B.S. or B.A. must also complete an additional 30 hours (to reach the 72 hour post B.S./B.A. requirement). Students must satisfactorily pass written and oral candidacy examinations covering their discipline and supporting areas. These examinations must be completed at least one year before completion of the Ph.D. degree program in Agricultural, Food and Life Sciences. Each candidate must complete a doctoral dissertation on an important research topic in the concentration field. The specific problem and subject of the dissertation is determined by the faculty adviser, the student and the Graduate Advisory Committee. A dissertation title must be submitted to the dean of the Graduate School at least one year before the dissertation defense. Provisional approval of the dissertation must be given by all members of the Graduate Advisory Committee prior to the dissertation defense. Students must pass the oral defense and examination of the dissertation given by the Graduate Advisory Committee. A student cannot be approved for conferral of the doctoral degree until after completion of all coursework, written and oral candidacy exams, the defense passed and dissertation accepted by the Graduate School and an application for the degree has been filed with the Registrar's Office and the fee paid.

In addition to the general requirements for the Ph.D. program in Agricultural, Food and Life Sciences, students in the Horticulture concentration must complete 9 graduate-level credits of HORT courses.

Graduate Faculty

Cato, Aaron J., Ph.D. (University of Arkansas), M.S. (Kansas State University), B.S. (Arkansas State University), Assistant Professor, 2019.
Clark, John R., Ph.D. (University of Arkansas), M.S., B.S. (Mississippi State University), Distinguished Professor, 1983.
Garcia, M. Elena, Ph.D., M.S. (University of Arkansas), B.A. (University of Arkansas at Little Rock), Professor, 2005.
Karcher, Douglas Edward, Ph.D., M.S. (Michigan State University), B.S. (The Ohio State University), Professor, 2000.
Lee, Jacquelyn A., Ph.D., M.S. (University of Arkansas), B.S. (Arkansas Technical University), Associate Professor, 2016.
Mackay, Wayne A., Ph.D. (University of Maryland), M.S. (University of Delaware), B.S. (Virginia Polytechnic Institute and State University), Professor, 2014.

McDonald, Garry Vernon, Ph.D., M.S., B.S.A. (Texas A&M University), Clinical Assistant Professor, 2016.

McWhirt, Amanda L., Ph.D. (North Carolina State University), M.S. (Louisiana State University), B.S. (Tarleton State University), Assistant Professor, 2016.

Richardson, Mike, Ph.D. (University of Georgia), M.S. (Louisiana State University), B.S. (Louisiana Tech University), Professor, 1998.

Robbins, James A., Ph.D. (University of California-Davis), M.S. (University of Georgia), B.S. (University of Wisconsin), Professor, 1998.

Rom, Curt R., Ph.D., M.S. (The Ohio State University), B.S. (University of Arkansas), University Professor, 1989.

Shi, Ainong, Ph.D. (North Carolina State University), M.S. (Graduate School of Chinese Academy of Agricultural Sciences), B.S. (Zhejiang University), Assistant Professor, 2013.

Worthington, Margaret L., Ph.D. (North Carolina State University), M.S. (University of California-Davis), B.S. (Duke University), Assistant Professor, 2016.

Courses

HORT 5001. Seminar. 1 Hour.

Review of scientific literature and oral reports on current research in horticulture. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

HORT 501V. Special Topics in Horticulture, Turf or Landscape. 1-6 Hour.

(Formerly HORT 401V.) Topics related to horticulture, turfgrass or landscape science or management not covered in other courses or a more intensive study of a specific topic. Graduate degree credit will not be given for both HORT 401V and HORT 501V. (Typically offered: Irregular) May be repeated for degree credit.

HORT 502V. Horticulture Judging and Competition Activity. 1-6 Hour.

(Formerly HORT 402V.) Training for and participation on horticultural identification, judging and competitive teams. Graduate degree credit will not be given for both HORT 402V and HORT 502V. Prerequisite: HORT 2003. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HORT 503V. Special Problems Research. 1-6 Hour.

Original investigations on assigned problems in horticulture. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HORT 5043. Advanced Plant Breeding. 3 Hours.

Application of genetic principles to the improvement of crop plants. Presentation of conventional plant breeding methods and special techniques such as polyploidy, interspecific hybridization and induced mutation. Lecture 3 hours per week. Prerequisite: BIOL 2323 and BIOL 2321L or (ANSC 3123 and CSES 4103). (Typically offered: Spring Odd Years)

HORT 5103. Plant Growth and Development. 3 Hours.

This course will focus on environmental and developmental processes of plant growth and development. A student completing this course should have an understanding of the developmental processes of plant growth and how environmental factors interact to affect and control plant growth and development. (Typically offered: Fall)

HORT 5113. Fruit Production Science and Technology. 3 Hours.

(Formerly HORT 4103.) The management technologies and cultural practices of fruit crops including (but not limited to) blueberries, blackberries, raspberries, strawberries, grapes, peaches, and apples will be presented. The underlying scientific principles of crop genetics, nutrition, and physiology will be presented as a basis for making management decisions in fruit crop productions. Graduate degree credit will not be given for both HORT 4103 and HORT 5113. Corequisite: Lab component. Prerequisite: HORT 2003. (Typically offered: Spring Odd Years)

HORT 5143. Professional Landscape Management. 3 Hours.

Principles and practices of landscape management and maintenance. Topics include low maintenance and seasonal color design, pruning and hazard tree management, water and fertilizer management, pesticide use, and other maintenance activities. Basic elements of marketing, specifications and contracts, estimating, personnel management, and equipment selection and acquisition relevant for landscape services will be introduced. Preparatory training in agribusiness or business is suggested. Prerequisite: HORT 2003 and HORT 3103. (Typically offered: Fall Odd Years)

HORT 5153. Sustainable Techniques in Urban Horticulture. 3 Hours.

Student will learn basic techniques in sustainable production of horticultural crops in an urban or small-scale environment. Crops may include vegetables, cut flowers, or small fruits. This course is intended for students who do not have an agricultural production background or for those students wanting to learn more about the production of high-value horticultural crops under sustainable production systems. For graduate credit, students will be expected to design a four-year crop rotation scheme using sustainable techniques. The student will also develop a plan addressing issues such as post-harvest handling and or food safety issues. (Typically offered: Summer)

HORT 5203. Temperature Stress Physiology. 3 Hours.

This course will teach students how to apply biological, chemical and physical principles to models of how plants are damaged by temperature extremes and how they change to increase resistance. Student will apply these principles to better understand plant responses to other environmental challenges, including both biotic and abiotic stresses. (Typically offered: Spring)

HORT 530V. Special Problems. 1-6 Hour.

(Formerly HORT 400V.) Original investigations on assigned problems in horticulture. Graduate degree credit will not be given for both HORT 400V and HORT 530V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HORT 5333. Professional Landscape Installation and Construction. 3 Hours.

(Formerly HORT 4033.) Principles and practices involved in landscape installation and construction. Topics covered include sequencing construction activities, protecting existing trees, landscape soils, selecting plants, planting and transplanting plant materials, wood construction, cement and masonry construction, and low-voltage lighting. Lecture 3 hours per week. Preparatory training in agribusiness or business is suggested. Graduate degree credit will not be given for both HORT 4033 and HORT 5333. Prerequisite: HORT 2003. (Typically offered: Fall Even Years)

HORT 5403. Plant Propagation. 3 Hours.

(Formerly HORT 4403.) Principles of plant propagation using seeds, cuttings, grafting, budding, layering, and tissue culture. The physiological basis of propagation is described. Knowledge of plant growth and physiology is needed. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both HORT 4403 and HORT 5403. Corequisite: Lab component. Prerequisite: BIOL 1613 and BIOL 1611L. (Typically offered: Spring)

HORT 5413. Horticulture Physiology. 3 Hours.

(Formerly HORT 4413.) This course provides students with a background into the physiological processes of plants with an emphasis on horticultural crops and how the processes relate to horticultural crop production practices. Among the topics covered are photosynthesis, respiration, water relations and morphogenesis. Graduate degree credit will not be given for both HORT 4413 and HORT 5413. Prerequisite: HORT 2003 and CHEM 1073. (Typically offered: Spring)

HORT 5503. Sustainable Nursery Production. 3 Hours.

(Formerly HORT 4503.) This course addresses issues and practices involved in production of quality woody nursery crops (e.g. trees and shrubs produced in open filed and containerized systems). Graduate degree credit will not be given for both HORT 4503 and HORT 5503. (Typically offered: Spring Even Years)

HORT 5701L. Greenhouse Management and Controlled Environment Horticulture Laboratory. 1 Hour.

(Formerly HORT 4701L.) Laboratory involving hands-on experiments designed to demonstrate principles discussed in the lecture section. Includes field trips. Graduate degree credit will not be given for both HORT 4701L and HORT 5701L. Corequisite: HORT 5703. (Typically offered: Fall Odd Years)

HORT 5703. Greenhouse Management and Controlled Environment Horticulture. 3 Hours.

(Formerly HORT 4703.) Operation and management of greenhouses and other controlled environments used in horticultural production. Emphasis on system design and construction, control of light intensity and photoperiod, heating and cooling systems, substrates, mineral nutrition, water quality and irrigation systems. Graduate degree credit will not be given for both HORT 4703 and HORT 5703. Prerequisite: HORT 2003 and CHEM 1073. (Typically offered: Fall)

HORT 5801L. Greenhouse Crops Production Laboratory. 1 Hour.

(Formerly HORT 4801L.) Laboratory involving hands-on experiments designed to demonstrate principles discussed in the lecture section. Includes field trips. Graduate degree credit will not be given for both HORT 4801L and HORT 5801L. Corequisite: HORT 5803. (Typically offered: Spring Even Years)

HORT 5803. Greenhouse Crops Production. 3 Hours.

(Formerly HORT 4803.) Principles and practices of production and marketing of crops commonly grown in controlled environments including flowering containerized herbaceous species, geophytes, annual and perennial bedding plants, hydroponic vegetables and herbs. Graduate degree credit will not be given for both HORT 4803 and HORT 5803. Prerequisite: HORT 4703 or HORT 5703 (formerly HORT 4703). (Typically offered: Spring Even Years)

HORT 5903. Golf and Sports Turf Management. 3 Hours.

(Formerly HORT 4903.) Turf management techniques for golf courses, and athletic fields including species selection, root-zone construction and modification, fertilization, mowing, irrigation and pest control. Graduate degree credit will not be given for both HORT 4903 and HORT 5903. Corequisite: Lab component. Prerequisite: CSES 2203 and CSES 2201L and (HORT 2303 or HORT 3403). (Typically offered: Fall Odd Years)

HORT 5913. Rootzone Management for Golf and Sports Turf. 3 Hours.

(Formerly HORT 4913.) An overview of the fundamental concepts of the physical and chemical properties of rootzones as related to construction and turfgrass management. Graduate degree credit will not be given for both HORT 4913 and HORT 5913. Corequisite: Lab component. Prerequisite: HORT 2303. (Typically offered: Spring Odd Years)

HORT 5921. Golf Course Operations. 1 Hour.

(Formerly HORT 4921.) This course is designed to cover specific aspects of golf course operations that would not be included in traditional turfgrass management courses. Topics will include budgeting, personnel management, tournament setup and operation, dealing with golf club committees, communication, and other relevant topics related to managing a golf course maintenance operation. Graduate degree credit will not be given for both HORT 4921 and HORT 5921. Prerequisite: HORT 4903 or HORT 5903 (formerly HORT 4903). (Typically offered: Fall Even Years)

HORT 5932. Turf Best Management Practices. 2 Hours.

(Formerly HORT 4932.) The course covers the impacts of turfgrass management practices on turf quality and the environment. In addition, the identification, biology, and control practices for the major insects, diseases, and weeds that infest turf will be covered. Emphasis will be placed on management strategies that include both chemical and non-chemical approaches to the prevention and control of common turfgrass pests. Graduate degree credit will not be given for both HORT 4932 and HORT 5932. Prerequisite: HORT 2303, PLPA 3003 and ENTO 3013. (Typically offered: Spring Odd Years)

HORT 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with AGED 5993, FDSC 5993.

HORT 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HORT 602V. Special Topics in Horticulture. 1-3 Hour.

Discussion and advanced studies on selected topics in genetics, plant breeding, physiology and culture of horticultural crops. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

HORT 6033. Molecular Plant Breeding. 3 Hours.

In-depth study of genetic improvement and techniques. Covers both current and classical literature. Topics to be discussed: haploidy, genetic control of pairing, somatic instability, tissue culture and protoplast fusion, and male sterility. Lecture discussion 3 hours per week. Prerequisite: BIOL 2323 and BIOL 2321L (or ANSC 3123 and CSES 4103 or equivalent). (Typically offered: Fall)

HORT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. May be repeated for degree credit. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

Human Environmental Sciences (HESC)

Donna L. Graham

Interim Director

118 Human Environmental Sciences Building

479-575-4305

Human Environmental Sciences Website (<https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fhuman-environmental-sciences.uark.edu%2Facademics%2Fgraduate-programs%2Findex.php&data=02%7C01%7Cpkoski%40uark.edu%7Ce0520da994b34d0477d708d7d8197b69%7C79c742c4e61c4fa5be89a3cb566a>)

Degree Conferred:

M.S. (HESC)

Areas of Study: Apparel merchandising and product development; human nutrition and hospitality innovation; human development and family sciences; and general human environmental sciences.

M.S. in Human Environmental Studies

Prerequisites to Degree Program: Applicants are expected to have sufficient undergraduate preparation to be admitted to the program. An admissions committee that is appointed by the Director at the time an application for admission is received determines eligibility for admission to any of the program areas. The admissions committee specifies any deficiencies in admission requirements that must be met by students who are admitted.

Requirements for the Master of Science Degree: The School of Human Environmental Sciences requires that at least 50 percent of the course requirements be earned from courses at the 5000 or 6000 level. This degree allows for a thesis and non-thesis option. All students awarded a Graduate Assistantship are expected to complete the thesis option;

students on AAES support are required to complete a thesis. The thesis option is also recommended for students who plan to continue their education beyond the Master of Science degree. There are three areas of concentration: Apparel Merchandising and Product Development; Food, Human Nutrition and Hospitality; and Human Development and Family Sciences.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Thesis Option: The thesis option requires a minimum of 30 semester hours. Of those 30 hours, six semester hours of thesis research are required and it is expected that at least 12 hours of course work originates within the area of concentration. Students must also take at least one course each in graduate statistics and research methods.

Non-thesis Option: The non-thesis option is available for students in any concentration who are pursuing their degree through distance education. Students may take any or all of their courses online. The non-thesis option requires a minimum of 33 semester hours of graduate level course work. It is expected that a minimum of 15 of the semester hours originate in the student's area of concentration. Students must also take at least one course each in graduate statistics and research methods. Non-thesis track students are required to pass both written and oral comprehensive exams. Students are strongly encouraged to consult with their advisers and the program website for the sequencing and availability of distance education courses offered by the School of Human Environmental Sciences.

Graduate Faculty

Apparel Merchandising and Product Development Courses

AMPD 5003. Apparel Sourcing and Merchandising Systems in the Global Economy. 3 Hours.

Evaluation of key issues facing textiles and apparel supply chain businesses in the global economy considering economic, political, and social perspectives and professional implications. Lecture 3 hours. (Typically offered: Fall Odd Years)

AMPD 5023. Social, Psychological and Cultural Aspects of Dress. 3 Hours.

Integration of social, psychological and cultural theories as they apply to appearance and clothing behavior. Lecture 3 hours. (Typically offered: Fall Odd Years)

AMPD 5033. Issues and Trends in Textile Studies. 3 Hours.

Studies of advances in textile science and recent developments in the textile industry. Lecture 3 hours. (Typically offered: Spring Odd Years)

AMPD 5043. Theories and Practices in Apparel Merchandising. 3 Hours.

Theoretical perspectives, concepts and current practices that influence apparel merchandising. Lecture 3 hours. (Typically offered: Spring Even Years)

AMPD 5063. Advanced Apparel Production. 3 Hours.

(Formerly AMPD 4063.) An advanced study of product development incorporating technology used in the industry for a career in fashion merchandising and/or product development in a computer laboratory environment. Laboratory 6 hours per week. Graduate degree credit will not be given for both AMPD 4063 and AMPD 5063. Prerequisite: AMPD 2033, AMPD 2063 and AMPD 3003. (Typically offered: Fall and Spring)

AMPD 5093. Apparel Merchandise Planning and Inventory Control. 3 Hours.

(Formerly AMPD 4093.) Describes today's challenges for both apparel manufacturers and retailers in meeting the consumer's demands for the right products at the right prices - and at the right times. Follows the evolution of the merchandising function with emphasis on production efficiency, highlighting the philosophies of industry executives and the effective integration of the merchandising, store design, marketing, the apparel supply chain and manufacturing functions along the way. Graduate degree credit will not be given for both AMPD 4093 and AMPD 5093. Prerequisite: AMPD 3033. (Typically offered: Fall and Spring)

AMPD 5103. Evolution of Fashion and Society Through Television Media. 3 Hours.

(Formerly AMPD 4103.) This course uses television programming from its early beginnings in the 1930s through to the twenty-first century to trace major events, societal changes, and the associated evolution of fashion. The course examines television both as an innovator and diffuser of fashion trends. Graduate degree credit will not be given for both AMPD 4103 and AMPD 5103. (Typically offered: Fall and Spring)

AMPD 5111. History of Apparel Through Film from 1900 to Present. 1 Hour.

(Formerly AMPD 4111.) This course uses historic costume films to trace the evolution of clothing from 1900 to Present. Emphasis is placed on societal aspects such as politics, religion, economy, technology, education, sports, class structure, and gender roles, and how they affect and change dress. Web based course. Graduate degree credit will not be given for both AMPD 4111 and AMPD 5111. (Typically offered: Fall and Spring)

AMPD 5211. History of Apparel Through Film to 1900. 1 Hour.

(Formerly AMPD 4011.) This course uses historic costume films to trace the evolution of clothing from ancient Egypt to the Twentieth Century. Emphasis is placed on societal aspects such as politics, religion, economy, technology, education, sports, class structure, and gender roles, and how they affect and change dress. Web-based course. Graduate degree credit will not be given for both AMPD 4011 and AMPD 5211. (Typically offered: Fall and Spring)

AMPD 5223. Merchandising Application for the Apparel Industry. 3 Hours.

(Formerly AMPD 4023.) Application of merchandising theory, principles and practices in a capstone class. An in depth study of innovative apparel business concepts as applied to manufacturers and retailers of apparel including apparel classification, seasonal cycles, stock emphasis, assortment strategies, target customers, and apparel trends. Includes an overview of marketing communication including advertising, personal selling, and sales promotion. Graduate degree credit will not be given for both AMPD 4023 and AMPD 5223. Prerequisite: AMPD 3033 and AMPD 3043. (Typically offered: Fall and Spring)

AMPD 5233L. Computer Aided Textile Design. 3 Hours.

(Formerly AMPD 4033.) This course is designed to give students advanced skills in textile design using industry based computer aided design (CAD) software. Lab 4 hours per week. Graduate degree credit will not be given for both AMPD 4033L and AMPD 5233L. Prerequisite: AMPD 2033 and AMPD 2053. (Typically offered: Fall and Spring)

AMPD 5253. Historic and Contemporary Apparel. 3 Hours.

(Formerly AMPD 4053.) This course traces the evolution of clothing from ancient times to the twentieth century with emphasis upon Western civilization and includes the study of contemporary fashion as a social force including the origin, scope, theory, and history of the fashion business, the materials of fashion, the fashion producers, auxiliary fashion enterprises, designers, fashion leaders, and leading market. Cultural and economic factors affecting dress, adornment and customs associated dress will be stressed. The Lecture 3 hours per week. Graduate degree credit will not be given for both AMPD 4053 and AMPD 5253. (Typically offered: Fall and Spring)

AMPD 5901. AMPD Pre-Study Tour. 1 Hour.

(Formerly AMPD 4901.) A study of specific regional and international fashion markets for apparel studies in preparation for AMPD 591V AMPD Study Tour. The course examines the design, production, distribution and retailing of fashion goods from couture fashion to mass markets. AMPD 5901 is content specific to each AMPD 591V study tour and must be repeated for each study tour destination. A grade of 'C' or better is required to participate in AMPD 591V. Graduate degree credit will not be given for both AMPD 4901 and AMPD 5901. Prerequisite: 2.0 minimum GPA. AMPD majors with minimum 30 hours, or consent. (Typically offered: Spring and Summer) May be repeated for up to 4 hours of degree credit.

AMPD 591V. AMPD Study Tour. 2-6 Hour.

(Formerly AMPD 491V.) An on-site study of specific regional and international fashion markets for apparel merchandising and product development. Course further examines the design, production, distribution and retailing of fashion goods from couture fashion to mass markets as outlined in AMPD 4901. Course includes study trip; length based upon destination. Additional fees required. Course will also be offered each May and August Intersession. Graduate degree credit will not be given for both AMPD 491V and AMPD 591V. Prerequisite: AMPD 4901 (with a C or better), 2.0 min. GPA, AMPD major with min. 30 hours, and instructor consent. Corequisite: AMPD 4901 (with a C or better, if corequisite, must have C or better at time of trip), 2.0 min. GPA, AMPD major with min. 30 hours, and instructor consent. (Typically offered: Summer) May be repeated for up to 24 hours of degree credit.

Hospitality Courses

HOSP 5643. Meetings and Convention Management. 3 Hours.

Focuses on the planning and management of meetings and conventions in the hospitality industry. (Typically offered: Fall)

HOSP 5653. Global Travel and Tourism Management. 3 Hours.

The course recounts the history of travel, explores the future, and discusses the components of tourism from a global perspective. (Typically offered: Spring)

HOSP 5663. Critical Issues and Trends in Hospitality and Tourism. 3 Hours.

The hospitality industry is arguably one of the most important sources of income and foreign exchange and is growing rapidly. However, national and international crises have huge negative economic consequences. This course explores change in the world and applies this to forecasting change in the hospitality and tourism industries. This course examines the current state of the industry and makes educated predictions to the future of the lodging, cruise, restaurant, technology, and travel and tourism industries. (Typically offered: Spring)

HOSP 5673. Destination Marketing and Operations. 3 Hours.

This course is designed to provide students with a basic understanding of the tasks and processes involved in running a successful destination of management organization (DMO). This course places heavy emphasis on destination marketing. Prerequisite: HOSP 1603. (Typically offered: Spring)

HOSP 5693. Hospitality Management Internship. 3 Hours.

Supervised experience in an instructor approved work /learning situation relating to the hospitality industry in multiple aspects of a hospitality organization. Emphasis on application of knowledge and skills to actual job roles and responsibilities. Requires employment in a hospitality setting for a minimum of 250 clock hours. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

Human Environmental Sciences Courses

HESC 500V. Special Problems. 1-6 Hour.

(Formerly HESC 400V.) Special problems. Graduate degree credit will not be given for both HESC 400V and HESC 500V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HESC 502V. Special Problems Research. 1-6 Hour.

Individual study or research for graduates in the field of human environmental sciences. (Typically offered: Fall, Spring and Summer)

HESC 5053. Survey Design and Scale Development. 3 Hours.

This course is designed to provide the expertise required to design and conduct survey research. Students will understand the instruments (scales/questionnaire) used in data collection processes and acquire the statistical skills necessary to develop and test these survey instruments. This course uses both theory and practice. Hands-on training will be provided via SPSS package for data analyses, and Qualtrics will be used for web-based surveys. Prerequisite: 3 hours of graduate-level statistics coursework and HESC 5463 or AGED 5463 or instructor consent. (Typically offered: Spring)

This course is cross-listed with AGED 5493.

HESC 5111. Introduction to Graduate Program. 1 Hour.

Overview of graduate program in the School of Human Environmental Sciences. 1 hour. Topics include master's program requirements; graduate student responsibilities; timetable for academic year; forms and deadlines; scheduling and time management; library searches; fundamentals of writing literature reviews; quantitative, qualitative, and mixed research methods; secondary data analyses; and tips for research presentations. Prerequisite: Departmental Consent. (Typically offered: Fall)

HESC 5211. Professional Development. 1 Hour.

Discussion of current literature and research. 1 hour. Topics include diverse research topics and methods in Human Environmental Sciences, professional development, and career opportunities in academia and industry. Prerequisite: HESC 5111 or Departmental Consent. (Typically offered: Fall)

HESC 5463. Research Methodology in Social Sciences. 3 Hours.

Logical structure and the method of science. Basic elements of research design; observation, measurement, analytic method, interpretation, verification, presentation of results. Applications to research in the economic and sociological problems of agriculture and Human Environmental Sciences. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with AGED 5463.

HESC 555V. Special Topics in Human Environmental Sciences. 1-3 Hour.

Topics not covered in other courses or a more intensive study of specific topics in the specializations of human environmental sciences. (Typically offered: Irregular)

HESC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HESC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Nutrition Courses

NUTR 5113. Advanced Nutrition. 3 Hours.

(Formerly NUTR 4213.) Normal nutrition with emphasis on utilization of nutrients. Lecture and reports on current literature 3 hours per week. Graduate degree credit will not be given for both NUTR 4213 and NUTR 5113. Prerequisite: CHEM 3813 and NUTR 3203. (Typically offered: Fall)

NUTR 521V. Readings in Nutrition. 1-6 Hour.

Seminar and individual study. Prerequisite: Instructor consent. (Typically offered: Irregular)

NUTR 5223. Nutrition During the Life Cycle. 3 Hours.

Study of normal nutrition emphasizing quantitative needs for nutrients as functions of biologic processes that vary during stages of the life cycle. Nutritive needs during pregnancy and childhood are emphasized with some attention to nourishing aging and elderly adults. Factors that affect food choices and eating behavior are also considered. Lecture 3 hours per week. On campus and web-based delivery is offered. Prerequisite: Graduate standing and consent of instructor. (Typically offered: Fall)

NUTR 5243. Community Nutrition. 3 Hours.

(Formerly NUTR 4243.) Identifying, assessing, and developing solutions for nutritional problems encountered at the local, state, federal, and international levels. Lecture 3 hours per week. Graduate degree credit will not be given for both NUTR 4243 and NUTR 5243. (Typically offered: Spring)

NUTR 5263. Medical Nutrition Therapy I. 3 Hours.

Principles of medical nutrition therapy with emphasis on Nutrition Care Process, and the pathophysiology and current standards of practice for diseases and disorders. Lecture 3 hours per week. Prerequisite: Graduate standing and consent of instructor. (Typically offered: Fall)

NUTR 5273. Medical Nutrition Therapy II. 3 Hours.

Principles of medical nutrition therapy with emphasis on the Nutrition Care Process, and the pathophysiology and current standards of practice for diseases and disorders. Lecture 3 hours per week. Prerequisite: NUTR 5263. (Typically offered: Spring)

Human Resource and Workforce Development Education (HRWD)

Michael Hevel
 Department Head, Rehabilitation, Human Resources and Communication Disorders
 100 Graduate Education Building
 479-575-4924
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Vicki Dieffenderfer
 Coordinator, HRWD Graduate Studies
 101 Graduate Education Building
 479-575-5239
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Degrees Offered:

M.Ed. in Human Resource and Workforce Development Education
 Ed.D. in Human Resource and Workforce Development Education

Both the master's degree and the doctoral degree are offered online. For more information about the online offerings, visit the Global Campus descriptions of the Master of Education program (<http://online.uark.edu/programs/master-education-human-resource-workforce-development-education.html>) or the Doctor of Education program (<http://online.uark.edu/programs/doctor-education-human-resource-workforce-development-education.html>).

Program Description: The Human Resource and Workforce Development Education program prepares scholar/practitioners to be educators, managers, and consultants in academic, public, and private settings. This program focuses on human resource and workforce development (HRD) theory and best practices. The core values are excellence, intellectual freedom, integrity, service, learning, diversity and stewardship. The M.Ed. program is a 33-hour non-thesis online program. The Ed.D. program offers a Doctor of Education degree in Human Resource and Workforce Development Education. This program is designed for students who seek leadership careers in education, business, or industry settings. The Ed.D. program is a 96-hour online program.

M.Ed. in Human Resource and Workforce Development Education

Admission Requirements for the Master of Education Degree

Program: All candidates who seek admission to the program must submit

an application for admission and an application fee to the Graduate School. Applicants must meet all Graduate School requirements for admission with the exception of standardized tests. A minimum grade-point average (GPA) of 3.0 on the last 60 hours of attempted course work prior to the receipt of the baccalaureate degree from a regionally accredited institution is required for admission into the program.

Requirements for the Master of Education (M.Ed.) Degree: The student's program of study consists of the requirements listed below. Graduation requirements include (1) completing 33 semester hours (no thesis) with a minimum cumulative GPA of 3.0 (six hours may be transferred in but will not be calculated into the GPA); and (2) passing a Capstone Course in the final academic semester.

Required Core for Human Resource and Workforce Development Education – 21 hours

Required Research Courses

ESRM 5013	Research Methods in Education (Students can also take ESRM 5393 Statistics in Education and Health Professions)	3
HRWD 5433	HRWD Capstone	3

HRWD Core Courses

Career Development Pillar

HRWD 5113	Foundations of Human Resource & Workforce Development
HRWD 5123	Career Transitions
HRWD 5133	HRWD Diversity Issues

Organization Development Pillar

HRWD 5213	Organizational Analysis
HRWD 5223	Strategic Human Resource and Workforce Development Education
HRWD 5233	HRWD Employment, Legal, and Ethical Issues

Training and Development Pillar

HRWD 5313	Facilitating Learning in the Workplace
HRWD 5323	International HRWD
HRWD 5333	HRWD Technological Resources

Supplemental Courses

HRWD 571V	Independent Study
HRWD 572V	Workshop
HRWD 573V	Experiential Learning

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ed.D. in Human Resource and Workforce Development Education

Admission Requirements for the Doctor of Education (Ed.D.)

Degree Program: Applicants may obtain detailed instructions for application to the program at the Global Campus website (<http://wded.uark.edu/4529.htm>). You may also email RHRCgrad@uark.edu with questions about the admissions process. The Human Resource and Workforce Development Education faculty considers the following factors important in determining admission to the program:

1. Demonstration of interest in a career in human resource and workforce development education through an interview with the department's admissions committee.

2. Evidence of potential to contribute to the advancement of the field of workforce development education through research and professional leadership.
3. Previous work experience.
4. Commitment to an online delivery program.
5. Graduate grade point average
6. Old Graduate Record Examination Score: 1000 combined scores of verbal and quantitative, and a 4.0 on analytical writing.
7. New Graduate Record Examination Score: Verbal – 153; Quantitative – 150; and a 4.0 on analytical writing. Scores are valid for five years.

In addition to meeting university requirements for admission to the Graduate School (<https://graduate-and-international.uark.edu/graduate/future-students/>), applicants must apply to the Human Resource and Workforce Development Education program by submitting an application for admission specific to the Ed.D program in Human Resource and Workforce Development Education, an autobiographical sketch, and a resume via email to RHRCgrad@uark.edu.

Requirements for the Ed.D. Degree in Human Resource and Workforce Development Education: Candidates for the Doctor of Education Degree in Human Resource and Workforce Development Education must complete a minimum of 96 total semester hours of graduate study.

Human Resource and Workforce Development Education:

Research and Statistics – 33 hours (including 18 dissertation hours)

ESRM 6403	Educational Statistics and Data Processing	3
HRWD 6313	Project and Program Evaluation	3
HRWD 6323	Qualitative Research Design and Analysis	3
HRWD 6333	Quantitative Research Design and Analysis	3
HRWD 6343	Principles and Techniques of Research in HRWD	3
HRWD 700V	Doctoral Dissertation	18

Human Resource and Workforce Development Education Core – 24 hours

Career Development Pillar

HRWD 5113	Foundations of Human Resource & Workforce Development	3
HRWD 6413	Career Theory and Decision Making	3

Organizational Pillar

HRWD 6513	Organization Development	3
HRWD 6523	Leadership Models and Concepts	3
HRWD 6533	HRWD Ethical and Legal Issues	3

Training and Development Pillar

HRWD 6613	Learning and Teaching Theories	3
HRWD 6633	Technology Systems in Human Resource and Workforce Development	3
HRWD 6713	HRWD Curriculum Design	3

Electives

HRWD 6423	Practicum	
HRWD 6723	Entrepreneurial Development	
HRWD 6643	History and Foundations of HRWD	

Any University of Arkansas HRWD master's course excluding the Supplement Courses

Or other courses approved by committee

A minimum grade point average of at least 3.25 on all course work presented as part of the degree program. No graduate degree credit will be granted for any course grades below "C."

Satisfactory completion of all requirements governing the written and oral candidacy examinations, the dissertation, and the final oral dissertation defense.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Houin, Cameron B., Ph.D. (University of Arkansas), Lecturer, .
Hughes, Clarethia, Ph.D. (Virginia Polytechnic Institute and State University), M.S. (North Carolina State University), M.B.A. (University of Arkansas), B.A. (Clemson University), Professor, 2004.
Samuels, Mandel G., M.B.A. (University of Arkansas), B.A. (Oklahoma State University), Clinical Assistant Professor, 2012.

Courses

HRWD 5113. Foundations of Human Resource & Workforce Development. 3 Hours.

An overview of human resource and workforce development (HRWD) in organizations. Focus on the integration of training and development, career development, and organization development. Topics include strategic planning for human resource and workforce development, needs assessment, program development, application of workplace learning theories, career development theories and methods, and application of organization learning theories. (Typically offered: Fall, Spring and Summer)

HRWD 5123. Career Transitions. 3 Hours.

This advanced level course is intended for career development professionals and/or subject-matter experts interested in improving their career development skills within a structured or unstructured learning environment. The emphasis in this course is on gaining career development techniques and planning formal and informal career development strategies for the individual or the organization. (Typically offered: Spring)

HRWD 5133. HRWD Diversity Issues. 3 Hours.

This course emphasis is on current trends and case studies of diversity in the workplace. Prerequisite: Graduate standing. (Typically offered: Fall)

HRWD 5213. Organizational Analysis. 3 Hours.

This course introduces the analysis process in organizations. The instruction and activities will enable students to develop skills in conducting organizational needs analysis (OA) as a basis for performance improvement in the workplace. (Typically offered: Spring and Summer)

HRWD 5223. Strategic Human Resource and Workforce Development Education. 3 Hours.

A comprehensive examination of the issues, topics, principles, theories, philosophies and concepts facing tomorrow's HRD professionals. Includes the transformation of strategic HRD; the role of strategic HRD leaders as change agents; the principles of strategic HRD; professional practice do mains of strategic HRD; organizational learning, performance, and change; and analysis, design, and evaluation of HPI interventions. Students will identify practices for informing decisions related to the formation of strategic HRD planning and implementation efforts. (Typically offered: Fall)

HRWD 5233. HRWD Employment, Legal, and Ethical Issues. 3 Hours.

This course focuses on employment, legal and ethical issues within the workplace. Students will gain knowledge that should enable them to be effective in understanding current employment concerns, equal employment opportunity (EEO) laws, and ethical practices within the workplace and how these employment concerns, laws, and practices impact society. (Typically offered: Spring)

HRWD 5313. Facilitating Learning in the Workplace. 3 Hours.

Facilitation of learning and performance improvement in the workplace. Application of instructional methods, formal and informal learning strategies, coaching, team building, and formal and informal on-the-job learning tactics. Focus on facilitating individual and group learning to affect organizational change. (Typically offered: Spring)

HRWD 5323. International HRWD. 3 Hours.

Exploration of how globalization and culture affect the workplace and the human resource development profession. Difference between global HRD and HRD practiced in a single country. Impact of culture on every aspect of HRD implementation and practice. Examination of HRD practices in different regions of the world. (Typically offered: Fall)

HRWD 5333. HRWD Technological Resources. 3 Hours.

This course provides students with the tools and abilities to evaluate and understand technology resources used in HRWD. Primary course elements are instructional design characteristics of technology, theoretical and practical uses of technology resources to facilitate and manage learning, and selecting the best or most appropriate technological resources. The course uses online technologies and learning experiences. (Typically offered: Fall)

HRWD 5433. HRWD Capstone. 3 Hours.

This course is the final course for the degree in Human Resource and Workforce Development. Students will be assessed on their overall knowledge and understanding of the field. The focus of this course will be research and analysis of classic works and current trends. Pre- or Corequisite: 27 MED credit hours completed. (Typically offered: Fall, Spring and Summer)

HRWD 571V. Independent Study. 1-3 Hour.

Independent study. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HRWD 572V. Workshop. 1-3 Hour.

Workshop. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HRWD 573V. Experiential Learning. 1-18 Hour.

This course is designed for the student to attain paid or unpaid experiential development. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

HRWD 6313. Project and Program Evaluation. 3 Hours.

This course is a doctoral level course designed as an introduction to project and program evaluation in human resource and workforce development. Emphasis is on (a) project design and development, (b) program development and improvement, and (c) the integration of evaluation with strategic planning and performance improvement. (Typically offered: Spring Even Years)

HRWD 6323. Qualitative Research Design and Analysis. 3 Hours.

This course is designed to introduce HRWD students to qualitative research design, data collection and data analysis. Course content includes data collection through interviews, field observation, records research, ethical issues associated with conducting research in organizational settings, and internal and external validity problems. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Spring Even Years)

HRWD 6333. Quantitative Research Design and Analysis. 3 Hours.

This course provides HRWD students with the tools and abilities to design and implement an original research project using quantitative measures. Primary course elements are research design application, theoretical settings of research, and nesting research within an appropriate literature base. The course uses online technologies and on-campus learning experiences. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Fall Even Years)

HRWD 6343. Principles and Techniques of Research in HRWD. 3 Hours.

This course addresses the principles and techniques underlying organizational research, both experimental and non-experimental. It covers the basic philosophy of science and research methods and gives attention to the practical problems of design, data collection sampling, and data analysis. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Fall Even Years)

HRWD 6413. Career Theory and Decision Making. 3 Hours.

This course focuses on comprehensive understanding of career theory and decision making to enhance career development that emphasizes technology, cross-cultural issues, practical application, and the global economy. Career development in both the private and public sectors will be explored. Students will gain knowledge that should enable them to be effective in developing their careers and those of others using multicultural considerations and a global perspective. (Typically offered: Fall)

HRWD 6423. Practicum. 3 Hours.

Practicum is designed to allow doctoral students in workforce development education an opportunity to apply the theoretical knowledge, skills and abilities to training, teaching, or research projects. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HRWD 6513. Organization Development. 3 Hours.

This course teaches development of organization activities that intervene in the interaction of people systems to increase the effectiveness of using a variety of applied behavioral sciences. It includes the dynamics of organizations, the genesis of organizational theory and evolution of organizational dynamics, including examination of system structure, chaos theory, group dynamics and interaction, leadership theories, diversity issues impacting organizations, and techniques of change agent intervention. (Typically offered: Summer Odd Years)

HRWD 6523. Leadership Models and Concepts. 3 Hours.

This doctoral course concentrates on using commonly accepted principles of leadership to develop skills needed in workforce development education settings. (Typically offered: Fall Odd Years)

HRWD 6533. HRWD Ethical and Legal Issues. 3 Hours.

Focuses on ethical and legal issues within the workplace and behavioral science research. Students gain knowledge that should enable them to be effective in understanding ethical and legal issues within their workplace and how they can impact society. (Typically offered: Fall)

HRWD 6613. Learning and Teaching Theories. 3 Hours.

Models and philosophies of important theorists in the field of teaching and learning. (Typically offered: Spring Odd Years)

HRWD 6633. Technology Systems in Human Resource and Workforce Development. 3 Hours.

This course provides students with the tools and abilities to evaluate and understand technology systems in HRWD. Primary course elements are instructional design characteristics of technology systems, theoretical and practical settings that use technology systems to facilitate and manage learning, and selecting the best or most appropriate system for organizational use. The course uses online technologies and learning experiences. (Typically offered: Fall Odd Years)

HRWD 6643. History and Foundations of HRWD. 3 Hours.

This course focuses on the history of human resource development as a practice and a profession. Particular emphasis in this course is placed on the influence of philosophy on developing HRD theory and practice. As students progress through this course they can expect to gain greater understanding of how HRD developed as a profession, the historical root of its theory and practice, and an understanding of how to evaluate the philosophical assumptions of current HRD theory and practice. (Typically offered: Fall Even Years)

HRWD 6713. HRWD Curriculum Design. 3 Hours.

Determining principles of curriculum development, implementation, and evaluation with emphasis in human resource development education. (Typically offered: Summer)

HRWD 6723. Entrepreneurial Development. 3 Hours.

An advanced graduate-level course examining the history, economics, theory and practice of developing Entrepreneurial enterprises. This course presents an overview of the business and organizational systems with which an entrepreneur should be familiar. (Typically offered: Irregular)

HRWD 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Industrial Engineering (INEG)

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Department of Industrial Engineering website (<http://industrial-engineering.uark.edu>)

Degrees Conferred:

M.S.E.M. (EMGT) (Go to Engineering Management (p. 126))
M.S.I.E. (INEG)
M.S.O.A. (OPAN) (Go to Operations Analytics (p. 251))
M.S.O.M. (OPMG) (Go to Operations Management (p. 252))
Ph.D. in Engineering (INEG) (Refer also to Engineering (p. 127))

Graduate Certificates Offered:

Homeland Security (p. 346) (non-degree) (OMHS)

Program Description: A critical component of all graduate-level work is scholarly activity through the completion of substantive research. These activities take place through the completion of doctoral dissertations, master's theses, and master's research projects. The department encourages the completion of master's theses, particularly for those students holding assistantship appointments. Research areas of concentration at both the master's and doctoral levels include the following: artificial intelligence/expert systems, computer assisted processes, computer integrated manufacturing, financial engineering, engineering administration, facilities analysis/design, human factors/ergonomics, manufacturing automation/robotics, material handling, operations research, productivity measurement/analysis, production control/scheduling, quality control/reliability, and health care/transportation logistics.

Primary Areas of Faculty Research: Automation and robotics; economic decision analysis; electronics manufacturing; engineering and quality management; ergonomics, human factors and safety; health care; manufacturing and transportation logistics; material handling and warehousing systems; operations research; quality, reliability, maintainability; and scheduling.

M.S.I.E. in Industrial Engineering

Application to the Graduate Program: Follow the procedures outlined by the Graduate School. To receive full consideration for assistantships and other financial aid, applications must be received before February 1.

Prerequisites to the M.S.I.E. Degree Program:

1. There are no prerequisites for students with an undergraduate degree from an ABET-accredited industrial engineering program.
2. For students with a degree other than an ABET-accredited industrial engineering degree, prerequisite courses may be required.

Requirements for the Master of Science in Industrial Engineering

Degree: In addition to the requirements of the Graduate School, the following departmental requirements must be satisfied by candidates for the M.S.I.E. degree:

1. Candidates who present a thesis are required to complete a minimum of 24 graduate credit hours plus six hours of INEG 600V Master's Thesis.
2. Candidates who present a project are required to complete a minimum of 27 graduate credit hours plus three hours of INEG 513V Master's Research Project and Report.
3. Candidates who do not present either a thesis or project are required to complete 30 semester hours of course work.
4. Candidates must successfully complete a master's oral examination that is conducted by the candidate's committee.
5. Courses Taken for Graduate Credit: A limited number of 4000-level courses may be taken for graduate credit.
6. Attendance at INEG graduate seminar is required of all graduate students in Industrial Engineering.

Accelerated M.S.I.E. Degree

High-achieving current undergraduate students seeking a B.S.I.E. degree at the University of Arkansas who choose to pursue graduate studies in INEG may participate in the accelerated M.S.I.E. program. Eligible students may take up to 6 credit hours of 5000 INEG courses as technical electives for their bachelor's degree and those hours will also count towards their M.S.I.E. degree. In addition, students may take another 6 credit hours of graduate degree credit as undergraduate students in order to apply them to their M.S.I.E. degree. These additional 6 hours of courses may not have been used towards the undergraduate degree and must meet the M.S.I.E. degree requirements. The total of 12 credit hours of graduate courses taken as an undergraduate student must be taken during the final 12 month period of their undergraduate degree.

Once fully admitted to the M.S.I.E. program, students request that up to 12 hours of 5000-level or above courses taken in the final 12-month period of their undergraduate degree count toward their graduate degree, if these courses were taken on the Fayetteville campus of the University of Arkansas. Students then take an additional 18 credit hours of approved INEG graduate-level courses (including INEG 600V or INEG 513V) in order to complete their M.S.I.E. degree.

Industrial engineering undergraduate students interested in the accelerated M.S.I.E. degree should apply to the program prior to starting the second-to-last semester of their undergraduate program. To be eligible, students must have a 3.5 cumulative GPA or higher and submit the normal application materials required by the graduate school for the M.S.I.E. degree program. For students that have a cumulative GPA of 3.5 or higher, the submission of GRE scores is waived.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Industrial Engineering

Application to the Graduate Program: Follow the procedures outlined by the Graduate School. To receive full consideration for assistantships and other financial aid, applications must be received before February 1.

In addition to the requirements of the Graduate School and those established by the College of Engineering for all doctoral graduates, the following requirements have been established for INEG doctoral graduates:

1. A minimum of 72 semester hours of graduate-level credit beyond the bachelor's degree.
2. A minimum of 42 semester hours of graduate-level credit beyond the master's degree of which a minimum of 21 semester hours shall be approved graduate level courses and a minimum of 21 semester hours of dissertation hours (INEG 700V).
3. Students admitted with a B.S. degree must complete their initial 30 semester hours out of the 72 total at the 5000-level or above, with the remaining 42 semester hours subject to the rule stated in paragraph 2 above.
4. Ph.D. students in Industrial Engineering must pass a Qualifier Exam over a subset of topics in Industrial Engineering determined by the student's Doctoral Advisory Committee. Students may fail the exam once and retake it. Students who fail the exam twice will be dismissed from the Ph.D. program.

Graduate Faculty

Cassady, Richard, Ph.D., M.S.I.S.E., B.S.I.S.E. (Virginia Polytechnic Institute and State University), University Professor, 2000.

Chimka, Justin Robert, Ph.D., M.S.I.E., B.S.I.E. (University of Pittsburgh), Associate Professor, 2002.

Eksioglu, Burak, Ph.D. (University of Florida), M.S.E.B.M. (University of Warwick), B.S.I.E. (Bogazici University), Professor, 2019.

Eksioglu, Sandra, Ph.D. (University of Florida), M.S.E.M.S.

(Mediterranean Agronomic Institute of Chania), B.S.B.A. (University of Tirana), Professor, 2019.

English, John R., Ph.D. (Oklahoma State University) P.E., M.S.O.R., B.S.E.E. (University of Arkansas), Professor, 1991.

Liao, Haitao, Ph.D., M.S., M.S.I.S.E. (Rutgers University), B.S.E.E. (Beijing Institute of Technology), Professor, 2015.

Liu, Xiao, Ph.D. (National University of Singapore), B.S.M.E. (Harbin Institute of Technology, China), Assistant Professor, 2017.

Milburn, Ashlea R., Ph.D. (Georgia Institute of Technology), M.S.I.E. (Virginia Polytechnic Institute and State University), B.S.I.E. (University of Arkansas), Associate Professor, 2010.

Nachtmann, Heather, Ph.D., M.S.I.E., B.S.I.E. (University of Pittsburgh), Professor, 2000.

Needy, Kim LaScola, Ph.D. (Wichita State University), P.E., M.S.I.E., B.S.I.E. (University of Pittsburgh), Professor, 2008.

Nurre Pinkley, Sarah, Ph.D., M.Eng., B.S. (Rensselaer Polytechnic Institute), Assistant Professor, 2015.

Parnell, Gregory S., Ph.D. (Stanford University), M.S. (University of Southern California), M.E.I.S.E. (University of Florida), B.S. (University of New York at Buffalo), Professor of Practice, 2013.

Pierson, Harry A., Ph.D. (The Ohio State University), M.S.E.M., B.S.M.E. (University of Missouri, Rolla), Assistant Professor, 2014.

Pohl, Edward A., Ph.D., M.S.R.E. (University of Arizona), M.S.S.E. (Air Force Institute of Technology), M.S.E.M. (University of Dayton), B.S.E.E. (Boston University), Professor, 2004.

Pohl, Letitia, Ph.D. (University of Arkansas), M.S.S.E. (Air Force Institute of Technology), B.S.M.E. (Tulane University), Teaching Assistant Professor, 2013.

Rainwater, Chase E., Ph.D. (University of Florida), B.S.I.E. (University of Arkansas), Associate Professor, 2009.

Rossetti, Manuel D., Ph.D., P.E., M.S.I.S. (The Ohio State University), B.S.I.E. (University of Cincinnati), Professor, 1999.

Sullivan, Kelly M., Ph.D. (University of Florida), M.S.I.E., B.S.I.E. (University of Arkansas), Associate Professor, 2012.

Zhang, Shengfan, Ph.D., M.I.E. (North Carolina State University), B.M. (Fudan University, Shanghai), Associate Professor, 2011.

Courses

INEG 513V. Master's Research Project and Report. 1-6 Hour.

Required course for students electing the report option. (Typically offered: Fall, Spring and Summer)

INEG 514V. Special Topics in Industrial Engineering. 1-3 Hour.

Consideration of current industrial engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

INEG 515V. Individual Study in Industrial Engineering. 1-3 Hour.

Opportunity for individual study of advanced subjects related to a graduate industrial engineering program to suit individual requirements. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

INEG 5163. Introduction to Modern Statistical Techniques for Industrial Applications. 3 Hours.

This application-oriented course is driven by real problems arising from industry and focuses on problem solving using both modern and classic statistical methods. For both senior undergraduate and graduate students, the main goal of this course is to provide a comprehensive introduction to those most popular statistical learning methods and tools (such as R and Apache Spark) which are widely used in industry today. For graduate students, this course will also cover the fundamental theory behind some of the methodologies. Students will not receive graduate degree credit for both INEG 410V with the same title, and INEG 5163. (Typically offered: Spring)

INEG 5243. Automated Manufacturing. 3 Hours.

Introduction to manufacturing processes and concurrent engineering in the electronics industry. Survey of electronics components and products and the processes of fabrication and assembly. Principles of design, productivity, quality, and economics. Emphasis on manufacturability. (Typically offered: Irregular)

INEG 5253. Leadership Principles and Practices. 3 Hours.

The course is designed to expose students to multiple approaches to leadership in a wide variety of settings. Leadership styles, the knowledge areas and competencies expected of today's leaders, the challenges leaders face, the historical and philosophical foundations of leadership, the relationships among leadership theory, leadership practice, and the moral-ethical aspects of leadership are among the topics covered in the course. A number of respected regional, national, and international leaders share 'lessons learned' in their leadership journeys. Plus, a number of highly regarded leadership books and case studies on leadership are read and discussed. Students may not receive credit for INEG 4253 and INEG 5253/OMGT 5253. (Typically offered: Fall)

This course is cross-listed with OMT 5253.

INEG 5263. Engineering Statistics. 3 Hours.

A graduate level engineering statistics course covering functions of random variables, properties and distributions of random samples, theory of statistical inference, and rationales of testing hypotheses and constructing confidence intervals. Prior knowledge of material equivalent to MATH 2574 and INEG 2333 is expected. (Typically offered: Fall)

INEG 5313. Engineering Applications of Probability Theory. 3 Hours.

Introduction to probability, discrete random variables, continuous random variables, multiple random variables, sequences of Bernoulli trials. Applications of these topics from inventory, reliability, quality control. (Typically offered: Fall)

INEG 5323. Engineering Applications of Stochastic Processes. 3 Hours.

Renewal processes, Poisson processes, discrete-time Markov chains, continuous-time Markov chains. Applications of these topics from inventory, reliability, quality control, queueing. (Typically offered: Spring)

INEG 5333. Design of Industrial Experiments. 3 Hours.

Statistical analysis as applied to problems and experiments in engineering and industrial research; experiment design and analysis; probability; and response surface analysis. (Typically offered: Irregular)

INEG 5373. Repairable Systems Modeling. 3 Hours.

Applications of probability, statistics, simulation and optimization to problems related to 1) modeling the performance of repairable equipment; 2) designing optimal inspection and maintenance policies for repairable equipment; and 3) optimizing the allocation of maintenance resources. (Typically offered: Irregular)

INEG 5393. Applied Regression Analysis for Engineers. 3 Hours.

Present concepts and applications to introduce statistical tools for discovering relationships among variables. Focus on fitting and checking linear and nonlinear regression models. Practical tools for engineers. (Typically offered: Irregular)

INEG 5423. Advanced Engineering Economy. 3 Hours.

(Formerly INEG 4423.) Preparation of feasibility studies, including cost estimation, risk and uncertainty, sensitivity analysis and decision making. Effects of taxes, depreciation and financing costs on cash flows. Graduate degree credit will not be given for both INEG 4423 and INEG 5423. (Typically offered: Irregular)

INEG 5433. Cost Estimation Models. 3 Hours.

Overview of cost estimation techniques and methodologies applied to manufacturing and service organizations. Accomplished through detailed analysis of the cost estimation development process and various cost estimation models. Topics include data collection and management, learning curves, activity based costing, detailed and parametric estimation models, and handling risk and uncertainty. (Typically offered: Irregular)

This course is cross-listed with OMG 5433.

INEG 5443. Decision Models. 3 Hours.

Focus on quantitative decision models for technical and managerial problems for private and public organizations. Topics include shareholder value, stakeholder value, Value-Focused Thinking, axioms of decision analysis, decision making challenges, decision traps, cognitive biases, decision processes, decision framing, influence diagrams, value hierarchy structuring, designing creative alternatives, single objective models, multiobjective additive value model, swing weights, sensitivity analysis, portfolio decision models with binary linear programming, probability elicitation, Bayes Law, decision trees, Monte Carlo simulation, expected value, dominance (deterministic and stochastic), tornado diagrams, value of information, risk preference, utility models, expected utility, and communicating analysis insights. (Typically offered: Irregular)

This course is cross-listed with OMG 5443.

INEG 5453. Systems Engineering and Management. 3 Hours.

(Formerly INEG 4433.) Overview of the fundamental concepts underlying the management of engineering. Reviews the engineering decision process within the life cycle. Examines implementation of basic management functions in technical organizations and development of strategy tools within a complex organization. Graduate degree credit will not be given for both INEG 4433 and INEG 5453. (Typically offered: Fall)

INEG 5463. Project Management. 3 Hours.

(Formerly INEG 4443.) Analysis of the strategic level of project management including planning, organizing, and staffing for successful project execution. Professional creativity, motivation, leadership, and ethics are also explored. At the tactical level, project selection, control, and systems management are analyzed. Systems development and decision support tools for project management are studied. Graduate degree credit will not be given for both INEG 4443 and INEG 5463. (Typically offered: Irregular)

INEG 5533. Network Optimization in Transportation Logistics. 3 Hours.

Focus on quantitative modeling and analysis of network optimization problems and their application in logistics system design and operation. Topics include network design and routing and location analysis, with emphasis on the application of both exact and heuristic solution techniques for large-scale instances of such problems. Prerequisite: INEG 5613. (Typically offered: Spring)

INEG 5563. Industrial Robotics. 3 Hours.

An interdisciplinary treatment of industrial robotics; manipulator anatomy, control, and programming; end-of arm tooling; sensors & sensing; system integration and safety; current research topics. Graduate-level lab assignments and examinations. Significant literature review and writing assignments. Not open to students with credit for INEG 4563. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall)

INEG 5613. Introduction to Optimization Theory. 3 Hours.

A graduate level introduction to the foundational rationales of numerical optimization methods including linear programming, integer programming, network flows, and discrete dynamic programming. Model formulation and tractability, search strategies, characterization of optimal solutions, duality and sensitivity, outcome justification. Prerequisite: Graduate standing. (Typically offered: Fall)

INEG 5623. Analysis of Inventory Systems. 3 Hours.

Elements of production and inventory control, economic lot size models, price breaks models using Lagrangian method, deterministic dynamic inventory model, probabilistic one-period and multi-period models, zero and positive lead time models, and continuous review models. Prerequisite: INEG 5313. (Typically offered: Irregular)

INEG 5683. Nonlinear Programming. 3 Hours.

An introduction to the theory and methodology of nonlinear programming. Focus on engineering and management science applications of nonlinear optimization. Both single and multi-variable as well as unconstrained and constrained problems are addressed. (Typically offered: Irregular)

INEG 5693. Heuristic Optimization. 3 Hours.

Theory and applications of methodological approaches explicitly addressed to heuristic or approximate optimization of integer and combinatorial models. Prerequisite: INEG 5613. (Typically offered: Irregular)

INEG 5803. Simulation. 3 Hours.

The development and use of discrete-event simulation models for the analysis and design of systems found in manufacturing, distribution, and service contexts. Coverage includes conceptual modeling, model translation to computer form, statistical input models, random number generation and Monte Carlo methods, experimentation and statistical output analysis, and queuing analysis. Includes the use of modern computer simulation languages. Cannot receive credit for both INEG 3623 and INEG 5803. Corequisite: Drill component. (Typically offered: Irregular)

INEG 5813. Introduction to Simulation. 3 Hours.

Development and use of discrete-event simulation models for the analysis and design of systems found in manufacturing, distribution, and service contexts. Coverage includes conceptual modeling, model translation to computer form, statistical input models, random number generation and Monte Carlo methods, experimentation and statistical output analysis, and queuing analysis. For off-campus, distance education students only. (Typically offered: Irregular)

INEG 5823. Systems Simulation I. 3 Hours.

Random number generation, random variate generation, timekeeping in simulations, discrete event modeling, construction of digital simulation models, statistical analysis of simulation results, and analysis of simulation experiments utilizing a computer programming language. (Typically offered: Irregular)

INEG 5833. Introduction to Database Concepts for Industrial Engineers. 3 Hours.

(Formerly INEG 4833.) An introduction to the basic principles of database modeling and technologies for industrial engineers. Coverage includes analyzing user requirements, representing data using conceptual modeling techniques (e.g. UML, ERD), converting conceptual models to relational implementations via database design methodologies, extracting data via structured query language processing, and understanding the role of database technology in industrial engineering application areas such as inventory systems, manufacturing control, etc. The application of a desktop database application such as Access will be emphasized. Graduate degree credit will not be given for both INEG 4833 and INEG 5833. (Typically offered: Irregular)

INEG 600V. Master's Thesis. 1-9 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

INEG 6113. Linear Optimization. 3 Hours.

A precise treatment of linear programming. Theory of convex sets, linear inequalities; development of the simplex method; duality theory; post optimality application and interpretation. Variants of the simplex methods and interior-point algorithms are discussed. Prerequisite: INEG 5613. (Typically offered: Fall)

INEG 614V. Special Topics for Doctoral Students in Industrial Engineering. 1-3 Hour.

Consideration of current industrial engineering topics at the doctoral level that are not covered in other courses. Prerequisite: PhD student in Industrial Engineering or consent of the instructor. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

INEG 6213. Integer Programming. 3 Hours.

This course offers the theory needed to model and efficiently solve large-scale binary, mixed and general integer programs. The tools needed to assess the computational complexity of these problems will be fully studied. Additional topics include the conceptual foundation required for the development of cutting plane, branch-and-price, Lagrange relaxation and constraint programming approaches. Implementation considerations specific to preprocessing, valid inequality generation and solution methodology convergence will be emphasized. Prerequisite: INEG 6113. (Typically offered: Spring)

INEG 6313. Network Optimization. 3 Hours.

A theorem/proof based advanced study providing rigorous exposition of foundational network optimization concepts including relevant optimization theory, algorithm development techniques, complexity analysis, data structures, and important applications. Prerequisite: INEG 6113. (Typically offered: Fall)

INEG 6323. Advanced Stochastic Processes. 3 Hours.

This course prepares Ph.D. students with advanced topics in probability and stochastic processes, with a focus on deriving and analyzing probability and stochastic models, and theorem proving in related topics. Contents include review of probability theorems, limit and convergence theorems, generating functions, Poisson processes, renewal theory, discrete and continuous Markov chains, and other advance topics. Prerequisite: INEG 5313 and INEG 5323. (Typically offered: Spring)

INEG 6363. Generalized Linear Models. 3 Hours.

Introduce the generalized linear model (GLM), inference, likelihood and diagnostics. Apply log linear and logistic models. Develop techniques for growth curves, and longitudinal and survival data. Cover spatial and normal linear models, and dynamic GLM for dependent data. (Typically offered: Irregular)

INEG 6443. Advanced Decision Analysis. 3 Hours.

The purpose of this course is to prepare the student to perform PhD and MS level research and analysis using advanced decision analysis concepts and techniques. The course topics include the history of decision analysis, foundations of decision analysis, structuring decision problems, assessing probabilities, probability management, Bayesian networks, utility, risk preference, risk analysis for engineering applications, intelligent adversary risk analysis, behavioral and organizational context for decision analysis, and major decision analysis applications. Prerequisite: INEG 5443. (Typically offered: Spring)

INEG 6823. Systems Simulation II. 3 Hours.

Advanced topics in computer simulation including experimental design, simulation optimization, variance reduction, and statistical output analysis techniques applied to discrete event simulation. Prerequisite: INEG 5823. (Typically offered: Irregular)

INEG 6843. Scheduling Theory and Algorithms. 3 Hours.

The course will cover the theory and solution methods for scheduling several tasks over time. Topics include terminology, measures of performance, single machine sequencing, flow shop scheduling, the job shop problem, and priority dispatching. Side constraints within scheduling, such as precedence, release dates, and due dates are addressed. Integer programming, dynamic programming, and heuristic approaches to various problems are also presented. Prerequisite: INEG 5613 or equivalent, computer programming proficiency, and exposure to proofs. (Typically offered: Irregular)

INEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Interdisciplinary Studies

Kim LaScola Needy

Dean of the Graduate School and International Education
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Patricia R. Koski

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Degrees Conferred:

M.S., Ph.D. in Cell and Molecular Biology (p. 56) (CEMB)
Ph.D. in Environmental Dynamics (p. 138) (ENDY)
M.S., Ph.D. in Microelectronics-Photonics (<http://catalog.uark.edu/graduatecatalog/programsstudy/microelectronicsphotonicsmeph/>) (MEPH)
Ph.D. in Public Policy (p. 281) (PUBP)
M.S., Ph.D. in Space and Planetary Sciences (p. 306) (SPAC)
M.S. in Statistics and Analytics (p. 318) (STAN)

Graduate Certificates (non-degree) offered:

Cross-Sector Alliances (p. 341) (CSAL)

Housed in the Graduate School, the Division of Interdisciplinary Studies is the home department for the cross-college interdisciplinary graduate programs: Graduate Certificates in Cross-Sector Alliances, Preparing for the Professoriate, and Sustainability; M.S. and Ph.D. degrees in Cell & Molecular Biology; Ph.D. degree in Environmental Dynamics; M.S. and Ph.D. degrees in Microelectronics-Photonics; Ph.D. degree in Public Policy; M.S. and Ph.D. degrees in Space & Planetary Sciences;

and M.S. in Statistics and Analytics. Program descriptions and course requirements may be found elsewhere in this catalog at the links above.

The common feature of these interdisciplinary programs is that their faculty members have voluntarily associated themselves with that academic community while being appointed faculty in our traditional departments. Each program operationally reports directly to the Associate Dean of the Graduate School, but works closely with the traditional departments that house actively participating program faculty members.

Courses

GRSD 5003. The Professoriate: Teaching, Learning and Assessment. 3 Hours.

Designed to introduce the future academic professional to the expectations of the faculty teaching role in higher education. Topics include techniques of effective teaching and learning, dealing with a variety of institutional expectations, course management issues, and using models of effective teaching across a broad spectrum of class sizes and levels. (Typically offered: Spring)

GRSD 5013. Practicum for Future Faculty. 3 Hours.

This course is designed to follow GRSD 5003 and to give participants opportunities to apply theories and methods learned in that course. To accomplish these goals, the course instructor helps the participant arrange a mentoring opportunity as part of this course. Prerequisite: GRSD 5003. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

GRSD 5033. The Professoriate: Research and Service. 3 Hours.

Designed to complement GRSD 5003 by focusing on topics of interest to future academic professionals beyond those related to instruction. Topics include developing a research statement, strategies for securing an academic position the general nature of employment and service expectations in higher education, research ethics, and funding issues, including grant proposal writing. (Typically offered: Fall)

GRSD 5041. Graduate Enrollment. 1 Hour.

This course allows a degree-seeking graduate student to continue as an active graduate student. Students should enroll in this course only when they are not enrolled in credit-bearing academic courses. This course cannot be counted for degree credit. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

School of Journalism and Strategic Media (JOUR)

Larry Foley
School Chair
205 Kimpel Hall
479-575-3601

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School of Journalism and Strategic Media Website (<http://fulbright.uark.edu/departments/journalism/>)

Degree Conferred:

M.A. in Journalism (JOUR)

Program Description: The purposes of the Journalism M.A. program are to refine the conceptual knowledge and skills of graduate journalism students through advanced writing, production and/or theory and methods

courses, to offer comprehensive, media-related courses; and to provide expertise in an additional academic discipline.

Primary Areas of Faculty Research: Faculty produce award-winning documentary films; cover national news stories on politics, government, business, and crime; report investigative stories using government databases; and research and publish in national journals on mass media effects, risk disclosures on responses to prescription drug ads, advertising clearance questions, management, and advertising ethics.

M.A. in Journalism

Areas of Study: The purposes of the Journalism M.A. program are to refine the conceptual knowledge and skills of graduate journalism students through advanced writing, production and/or theory and methods courses, to offer comprehensive, media-related courses; and to provide expertise in an additional academic discipline. Advanced journalism studies may be supplemented with up to six hours of graduate-level courses in academic disciplines other than journalism.

Prerequisites to Degree Program: Students must have appropriate professional experience and/or an undergraduate degree in the journalism field that is approved by the graduate coordinator or the Journalism Graduate Faculty Committee as preparation for graduate study. A student must have a minimum undergraduate grade-point average of 3.00 and should earn a minimum score of 300 on the verbal and quantitative parts of the Graduate Record Examinations (including a minimum score of 151 on the verbal part), and a minimum score of 4.5 on the analytical writing section.

Requirements for the Master of Arts Degree: In addition to the requirements of the Graduate School (p. 430), the Master of Arts degree in Journalism requires a minimum of 30 semester hours with a cumulative grade-point average of 3.00. Students must complete:

1. 18 hours of graduate credit in journalism; all students must take JOUR 5023 Journalism Theory and JOUR 5043 Research Methods in Journalism.
2. The remaining 6 hours of graduate course credit can be in journalism, or in a single department other than journalism chosen by the student and approved by the graduate coordinator or the Journalism Graduate Faculty Committee, and
3. A master's thesis (6 semester hours).

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for the Five-Year Bachelor/Master of Arts Degree: In the Five-Year Bachelor/Master of Arts program, students can complete requirements for both the B.A. and the M.A. degrees in five years. Students apply for "conditional admission" to the program before the end of the first semester of their junior year. They may then take 6 to 12 hours of graduate coursework as undergraduates, to apply exclusively toward the M.A. degree. After receiving the B.A., they spend a fifth year completing the M.A.. This may involve some summer school coursework.

Requirements for conditional admission to the Five-Year B.A./M.A. program include:

- Enrollment in the Journalism B.A. program.
- A minimum GPA of 3.0 in all semesters of undergraduate study.
- All other admission requirements of the Graduate School and the Journalism M.A. program.

Students may continue into the M.A. program in the fifth-year conditional on the following:

- Completion of a Journalism B.A. degree at the UA.
- Renewal of their application to the UA Graduate School.
- Continuation of a minimum GPA of 3.0 in all semesters of undergraduate study.
- Achieving satisfactory GRE scores: a minimum of 300 on the verbal and quantitative parts of the exam (including a minimum score of 151 on the verbal part), and a minimum score of 4.5 on the analytical writing section.
- Taking all coursework in the senior year and in graduate school at the UA.

Special guidelines: Students who have maintained a GPA of 3.5 or above in all semesters of their undergraduate study may petition for admission to the program without taking the GRE. Of the maximum 12 hours of graduate courses, these students may count up to 6 hours of Journalism 5000-level coursework toward both the B.A. and the M.A. degree. However, a grade of B or better is required in the 6 hours, and the courses must be approved by a student's Master's Advisory Committee or the journalism graduate coordinator.

Specific guidelines for graduate courses taken by undergraduates who apply to the Five-Year program: After completing the B.A., students may request retroactive graduate credit for up to 12 hours of JOUR 5000-level courses taken in the final 12 months of their undergraduate degree. The courses will be counted if:

- The courses were taken on the UA, Fayetteville campus in the Journalism program.
- The student was in good standing.
- The courses were 5000-level or above.
- The courses were not used for the B.A. degree.
- The student earned a grade of B or better.
- The courses are approved by the student's Master's Advisory Committee or the Journalism graduate coordinator. Petition to the Graduate School will be done either by the student's advisory committee or the graduate coordinator.

Graduate Faculty Courses

JOUR 5003. Advanced Reporting. 3 Hours.

Stresses public affairs coverage, interpretive, investigative, and analytic journalism, involving research, work with documents, public records, and budgets and specialized reporting. (Typically offered: Irregular)

JOUR 5013. Advanced Radio News Reporting. 3 Hours.

(Formerly JOUR 4033.) Intensive training in the production of in-depth, public radio style news stories. Graduate degree credit will not be given for both JOUR 4033 and JOUR 5013. Prerequisite: JOUR 2032 and JOUR 2031L, each with a grade of C or better. (Typically offered: Spring)

JOUR 5023. Journalism Theory. 3 Hours.

Examination of the major journalism and mass media theories and conceptual perspectives regarding journalism, news, mass media, advertising and public relations relevant to industry and academic researchers and professionals. (Typically offered: Fall)

JOUR 5043. Research Methods in Journalism. 3 Hours.

Research methods of utility in journalism. Emphasis on survey research, electronic data base searching, and traditional library research. Prerequisite: Graduate standing or honors program standing. (Typically offered: Spring)

JOUR 5063. Issues in Advertising and Public Relations. 3 Hours.

Seminar course involving the critical examination of the major cultural, social, political, economic, ethical, and persuasion theories and/or issues relevant to advertising and public relations affecting individuals, organizations, societies. Prerequisite: Graduate standing. (Typically offered: Fall)

JOUR 508V. Graduate Journalism Internship. 1-3 Hour.

Credit for practical experience gained through a journalistic internship. Must have completed 6 hours of graduate course credit. May be repeated for up to 3 hours of degree credit. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

JOUR 5093. Business Journalism. 3 Hours.

Examines how the U.S. economy works and how to find news in business, market and government data sources. Focuses on the role of corporations, financial markets, and regulators, and benefiting students interested in sports, entertainment, political and investigative journalism. (Typically offered: Spring)

JOUR 5133. Ethics in Journalism. 3 Hours.

A seminar examining the professional ethical principles and ethical performance in the journalism field. The ethical performance of the mass media dedicated to news, public relations and advertising is evaluated based on ethical theories and industry standards. Prerequisite: Graduate standing. (Typically offered: Fall)

JOUR 5163. Computer-Assisted Publishing. 3 Hours.

(Formerly JOUR 4063.) In-depth, hands-on exploration of computer hardware and software in the design and production of media messages. Examination of developing media technologies and the computer's influence on design and conceptualization. Graduate degree credit will not be given for both JOUR 4063 and JOUR 5163. (Typically offered: Irregular)

JOUR 5173. Social Media and Journalism. 3 Hours.

(Formerly JOUR 4073.) Social Media and Journalism teaches conceptual knowledge and skills to develop news judgment and use changing technological tools to disseminate news quickly and to different audiences. The value of interacting with sources and the audience is stressed as are ethical, legal and accuracy issues. Graduate degree credit will not be given for both JOUR 4073 and JOUR 5173. Prerequisite: JOUR 2013 or JOUR 2032 with a grade of C or better. (Typically offered: Fall)

JOUR 5193. Professional Journalism Seminar. 3 Hours.

Examination of complex problems encountered by professional journalists with focus on research and analysis of the role of journalism in major social, economic, and political developments. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

JOUR 5283. Data Journalism. 3 Hours.

Provides an in-depth experience of combining street reporting and data analysis to tell a story of significant societal importance. Students are introduced to techniques in data analysis, management, visualization and production of data-driven articles and multimedia presentations. Prerequisite: Instructor permission. (Typically offered: Fall)

JOUR 5313. Literature of Journalism. 3 Hours.

A study of superior works of non-fiction journalism, past and present. Includes authors from Daniel Defoe to John McPhee. (Typically offered: Irregular)

JOUR 5323. Documentary Production I. 3 Hours.

In-depth study of documentary film as non-fiction, long form journalism. Covers subject, funding, research and development, pre-production planning, field production, talent, music, post production, promotion, broadcast and distribution. Required trip to Hot Springs Documentary Film Festival. (Typically offered: Fall)

JOUR 5333. Documentary Production II. 3 Hours.

A continuation of JOUR 5323, Documentary Production I. Students photograph, write, and edit a documentary begun in the fall semester. Prerequisite: JOUR 5323. (Typically offered: Spring)

JOUR 5463. Campaigns. 3 Hours.

(Formerly ADPR 4463.) Applying advertising principles and techniques to preparation of a complete campaign; determining agency responsibilities, marketing objectives and research, media mix, and creative strategy. Emphasis also given to campaign presentation delivery, utilizing audio and visual techniques. Graduate degree credit will not be given for both ADPR 4463 and JOUR 5463. Prerequisite: ADPR 3723 and ADPR 3743, each with a grade of B or better, and 2.5 overall GPA. (Typically offered: Fall, Spring and Summer)

JOUR 5473. Account Planning. 3 Hours.

An introduction to applied advertising research and account planning. Integrate consumers' perspectives into creative strategy to developing brand stories for clients. Write creative briefs, positioning statements and prepare copy-testing research instruments to evaluate messages. Utilize consumer research for creating messages for diverse cultures. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

JOUR 5503. Magazine Writing. 3 Hours.

(Formerly JOUR 4503.) This intensive writing and reporting course is for students with proven feature-writing skills and an interest in the human-interest stories found in such leading magazines as The New Yorker, Esquire, Harper's, the Atlantic, and others. Students will compose magazine-length nonfiction stories on timely subjects under deadline. Stories are submitted for contests and publication, when possible. Graduate degree credit will not be given for both JOUR 4503 and JOUR 5503. Prerequisite: JOUR 2013 with a grade of C or better. (Typically offered: Spring)

JOUR 5883. Advanced Television News Production. 3 Hours.

(Formerly JOUR 4883.) Continuation of JOUR 4873. Students prepare and present television newscasts for air. Laboratory component arranged. Graduate degree credit will not be given for both JOUR 4883 and JOUR 5883. Corequisite: Lab component. Prerequisite: JOUR 4873 with a grade of C or better. (Typically offered: Irregular)

JOUR 5903. Community Journalism. 3 Hours.

(Formerly JOUR 4903.) This three-hour course will blend student reporting and editing skills with instruction on how regional newspapers select and present news to a local audience. This course will instruct students in deciding news stories for regional readers, how those stories can best be written and displayed. The semester goal is to publish a paper. Graduate degree credit will not be given for both JOUR 4903 and JOUR 5903. (Typically offered: Spring)

JOUR 5923. History of the Black Press. 3 Hours.

Covers the historic context of contributions and innovations to U.S. newspapers by African Americans. Also investigates the role of the black press from its beginnings in 1827 through the civil rights movement. (Typically offered: Spring Even Years)

JOUR 600V. Master's Thesis. 1-6 Hour.

Required of all M.A. journalism students. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Materials Science and Engineering (MSEN)

Rick Wise

Program Director

103 Nanoscale Material Science and Engineering Building

479-575-2875

Email: rickwise@uark.edu

Materials Science and Engineering Website (<https://materials-science-engineering.uark.edu/>)

Degrees Conferred:

M.S. in Materials Engineering (MATE)

M.S. in Materials Science (MATS)

Ph.D. in Materials Science and Engineering (MSEN)

Program Description: This multidisciplinary program prepares students for careers in the development and manufacturing of micro- to nanoscale materials, processing, and devices in such industries as biosensing, photonics, telecommunications, microelectronics, and MEMs. Typical students in this program will be full-time students residing on campus, but provisions may be made to support remotely located part-time students already engaged in professional careers.

Philosophy of Graduate Education: All entering graduate students from June 1 through May 31 of the following year are formed into a cohort. Cohort members form a natural work group during their first 24 months of graduate school, and the cohort members receive training in how to effectively apply their academic knowledge in professional group environments such as research- or teaching-based academic departments, large governmental research labs, or industrial settings. The cohort training also fosters a supportive graduate community atmosphere that enhances the likelihood of academic success of all the program's graduate students. The techniques used for this training have been developed at the University of Arkansas under the financial sponsorship of the NSF Integrative Graduate Education and Research Training program, and the Department of Education's Fund for Improvement of Post Secondary Education program. Through these methods, our graduate students exit our degree programs with the equivalent of one and a half years of on-the-job training in management techniques useful in a technology-based professional career setting.

Requirements for M.S. in Materials Engineering with Biological Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates have completed an ABET-accredited or equivalent Bachelor of Science degree in engineering and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Engineering without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students

in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Engineering Degree:

Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Engineering students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member of the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development (Core)	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
MSEN 6323 Materials Engineering Design (Core)	3	3	3
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5523 Applied On- Campus Collaborative Research with External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available

MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied in Ph.D. curriculum)	1	1
Additional Technical Elective	0	0	>/=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in 3 PhD studies	3
MSEN 5393 Product Development Process	N/A	N/A	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Engineering degree set. Both the undergraduate department and the MSEN Program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN Program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN Program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take

MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS

Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Biological Materials and Devices

Choose nine hours of the following:

9

BENG 4123	Biosensors & Bioinstrumentation
BENG 5103	Advanced Instrumentation in Biological Engineering
BMEG 5213	Tissue Mechanics
BMEG 5313	Advanced Biomaterials and Biocompatibility
ELEG 5773	Electronic Response of Biological Tissues
MEEG 5253	Bio-Mems
MEEG 5343	Computational Material Science
MSEN 6323	Materials Engineering Design
PHYS 5613	Introduction to Biophysics and Biophysical Techniques

Requirements for M.S. in Materials Engineering with Energy Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates have completed an ABET-accredited or equivalent Bachelor of Science degree in engineering and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Engineering without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Engineering Degree:

Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Engineering students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.

- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member of the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development (Core)	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4

MSEN 6323 Materials Engineering Design (Core)	3	3	3
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5523 Applied On- Campus Collaborative Research with External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied in Ph.D. curriculum)	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	N/A	N/A	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Engineering degree set. Both the undergraduate department and the MSEN Program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may

be substituted with the approval of the student's research adviser and the MSEN Program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN Program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take

MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Energy Materials and Devices

Choose nine hours from the following:

9

CHEM 5283	Energy Conversion and Storage
ELEG 5223	Design and Fabrication of Solar Cells
MEEG 5343	Computational Material Science
MSEN 5713	Advanced Nanomaterials Chemistry
MSEN 5733L	Fabrication at the Nanoscale
MSEN 6323	Materials Engineering Design

Requirements for M.S. in Materials Engineering with Mechanical and Structural Materials Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates have completed an ABET-accredited or equivalent Bachelor of Science degree in engineering and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Engineering without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Engineering Degree:

Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Engineering students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as

it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.

- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member of the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3

MSEN 5383 Research Commercialization and Product Development (Core)	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
MSEN 6323 Materials Engineering Design (Core)	3	3	3
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5523 Applied On- Campus Collaborative Research with External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied in Ph.D. curriculum)	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in 3 PhD studies	

MSEN 5393 Product Development Process	N/A	N/A	3
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If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Engineering degree set. Both the undergraduate department and the MSEN Program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN Program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN Program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take

MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission).

Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Mechanical and Structural Materials

Choose nine hours of the following:

9

MEEG 5033	Advanced Mechanics of Materials I
MEEG 5163	Advanced Product Design
MEEG 5303	Physical Metallurgy
MEEG 5343	Computational Material Science
MSEN 6323	Materials Engineering Design
PHYS 5713	Condensed Matter Physics I
PHYS 6713	Condensed Matter Physics II

Requirements for M.S. in Materials Engineering with Microelectronic-Photonic Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates have completed an ABET-accredited or equivalent Bachelor of Science degree in engineering and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Engineering without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

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in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Engineering

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Engineering students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member of the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development (Core)	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
MSEN 6323 Materials Engineering Design (Core)	3	3	3
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5523 Applied On- Campus Collaborative Research with External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available

MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied in Ph.D. curriculum)	1	1
Additional Technical Elective	0	0	>/=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in	3 PhD studies
MSEN 5393 Product Development Process	N/A	N/A	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Engineering degree set. Both the undergraduate department and the MSEN Program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN Program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN Program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take

MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS

Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Microelectronic-Photonic Materials and Devices

ELEG 5203	Semiconductor Devices	3
Choose six hours from the following:		6
ELEG 5213	Integrated Circuit Fabrication Technology	
ELEG 5223	Design and Fabrication of Solar Cells	
ELEG 5243L	Microelectronic Fabrication Techniques and Procedures	
ELEG 5273	Electronic Packaging	
ELEG 5293L	Integrated Circuits Fabrication Laboratory	
ELEG 5313	Power Semiconductor Devices	
ELEG 5323	Semiconductor Nanostructures I	
ELEG 5333	Semiconductor Nanostructures II	
ELEG 5353	Semiconductor Optoelectronic Devices	
ELEG 5363	Semiconductor Material and Device Characterization	
ELEG 5383	Introduction of Integrated Photonics	
ELEG 5393	Electronic Materials	

ELEG 5543	Introduction to Power Electronics
MEEG 5263	Introduction to Micro Electro Mechanical Systems
MEEG 5343	Computational Material Science
MSEN 6323	Materials Engineering Design
PHYS 5713	Condensed Matter Physics I
PHYS 5734	Laser Physics
PHYS 5753	Applied Nonlinear Optics
PHYS 5773	Introduction to Optical Properties of Materials
PHYS 6613	Quantum Optics
PHYS 6713	Condensed Matter Physics II

Requirements for M.S. in Materials Engineering with Nanoscale Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates have completed an ABET-accredited or equivalent Bachelor of Science degree in engineering and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Engineering without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Engineering

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Engineering students:

- Academic path: Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- Professional path: Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form

of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.

- Non-thesis path: Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member of the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each path are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3

MSEN 5383 Research Commercialization and Product Development (Core)	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
MSEN 6323 Materials Engineering Design (Core)	3	3	3
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5523 Applied On- Campus Collaborative Research with External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied in Ph.D. curriculum)	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in 3 PhD studies	

MSEN 5393 N/A N/A 3
 Product
 Development
 Process

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Engineering degree set. Both the undergraduate department and the MSEN Program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN Program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN Program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take

MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission).

Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Nanoscale Materials and Devices

Choose nine hours of the following:

9

CHEM 5443	Physical Chemistry of Materials
ELEG 5303	Introduction to Nanomaterials and Devices (Introduction to Nanomaterials and Devices)
MEEG 5333	Introduction to Tribology
MEEG 5343	Computational Material Science
MSEN 5713	Advanced Nanomaterials Chemistry
MSEN 5733L	Fabrication at the Nanoscale
MSEN 6323	Materials Engineering Design
PHYS 5713	Condensed Matter Physics I
PHYS 5723	Physics at the Nanoscale
PHYS 5783	Physics of 2D Materials
PHYS 6713	Condensed Matter Physics II

Requirements for M.S. in Materials Engineering with Materials Modeling Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates have completed an ABET-accredited or equivalent Bachelor of Science degree in engineering and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Engineering without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the

Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Engineering

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Engineering students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member of the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the

partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development (Core)	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
MSEN 6323 Materials Engineering Design (Core)	3	3	3
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5523 Applied On- Campus Collaborative Research with External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available

MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied in Ph.D. curriculum)	1	1
Additional Technical Elective	0	0	>/=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in 3 PhD studies	3
MSEN 5393 Product Development Process	N/A	N/A	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Engineering degree set. Both the undergraduate department and the MSEN Program Director must approve the shared courses prior to enrollment.

As part of each student’s curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student’s research adviser and the MSEN Program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN Program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take

MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS

Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student’s research adviser’s section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester’s research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student’s mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master’s thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master’s degrees (p. 451).

Concentration in Materials Modeling

Choose nine hours of the following: 9

CVEG 5383	Finite Element Methods in Civil Engineering
MEEG 5343	Computational Material Science
MEEG 5733	Advanced Numerical Methods
MSEN 6323	Materials Engineering Design
PHYS 5093	Applications of Group Theory to Physics
PHYS 5363	Scientific Computation and Numerical Methods
PHYS 5713	Condensed Matter Physics I
PHYS 6713	Condensed Matter Physics II

Requirements for M.S. in Materials Science with Biological Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates typically have completed a Bachelor of Science degree in the physical or natural sciences and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Science without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Science

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Science students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without the Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students

completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member from the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 5343 Computational Materials Science	3	3	3
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0

MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5323 Applied On- Campus Collaborative Research with External Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	Applied in Ph.D. Curriculum	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	Not Available	Not Available	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Science degree set. Both the undergraduate department and the MSEN program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two,

students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Biological Materials and Devices

Choose nine hours of the following:

9

BENG 4123	Biosensors & Bioinstrumentation
BENG 5103	Advanced Instrumentation in Biological Engineering
BMEG 5213	Tissue Mechanics
BMEG 5313	Advanced Biomaterials and Biocompatibility
ELEG 5773	Electronic Response of Biological Tissues

MEEG 5253	Bio-Mems
MEEG 5343	Computational Material Science
MSEN 6323	Materials Engineering Design
PHYS 5613	Introduction to Biophysics and Biophysical Techniques

Requirements for M.S. in Materials Science with Energy Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates typically have completed a Bachelor of Science degree in the physical or natural sciences and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Science without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Science

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Science students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without the Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at

least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.

- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member from the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 5343 Computational Materials Science	3	3	3
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development	3	3	3

MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5323 Applied On- Campus Collaborative Research with External Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	Applied in Ph.D. Curriculum	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	Not Available	Not Available	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Science degree set. Both the undergraduate department and the MSEN program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of

master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Energy Materials and Devices

Choose nine hours from the following:

9

CHEM 5283	Energy Conversion and Storage
ELEG 5223	Design and Fabrication of Solar Cells
MEEG 5343	Computational Material Science
MSEN 5713	Advanced Nanomaterials Chemistry
MSEN 5733L	Fabrication at the Nanoscale
MSEN 6323	Materials Engineering Design

Requirements for M.S. in Materials Science with Mechanical and Structural Materials Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates typically have completed a Bachelor of Science degree in the physical or natural sciences and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Science without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Science

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Science students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible

without the Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.

- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member from the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 5343 Computational Materials Science	3	3	3
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2

MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5323 Applied On- Campus Collaborative Research with External Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	Applied in Ph.D. Curriculum	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	Not Available	Not Available	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Science degree set. Both the undergraduate department and the MSEN program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title,

semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Mechanical and Structural Materials

Choose nine hours of the following:

9

MEEG 5033	Advanced Mechanics of Materials I
MEEG 5163	Advanced Product Design
MEEG 5303	Physical Metallurgy
MEEG 5343	Computational Material Science
MSEN 6323	Materials Engineering Design
PHYS 5713	Condensed Matter Physics I
PHYS 6713	Condensed Matter Physics II

Requirements for M.S. in Materials Science with Microelectronic-Photonic Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates typically have completed a Bachelor of Science degree in the physical or natural sciences and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Science without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Science

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Science students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without the Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member from the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each path are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 5343 Computational Materials Science	3	3	3

MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5323 Applied On- Campus Collaborative Research with External Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>/= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	Applied in Ph.D. Curriculum	1	1
Additional Technical Elective	0	0	>/=2

MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	Not Available	Not Available	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Science degree set. Both the undergraduate department and the MSEN program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the

advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Microelectronic-Photonic Materials and Devices

ELEG 5203	Semiconductor Devices	3
Choose six hours from the following:		6
ELEG 5213	Integrated Circuit Fabrication Technology	
ELEG 5223	Design and Fabrication of Solar Cells	
ELEG 5243L	Microelectronic Fabrication Techniques and Procedures	
ELEG 5273	Electronic Packaging	
ELEG 5293L	Integrated Circuits Fabrication Laboratory	
ELEG 5313	Power Semiconductor Devices	
ELEG 5323	Semiconductor Nanostructures I	
ELEG 5333	Semiconductor Nanostructures II	
ELEG 5353	Semiconductor Optoelectronic Devices	
ELEG 5363	Semiconductor Material and Device Characterization	
ELEG 5383	Introduction of Integrated Photonics	
ELEG 5393	Electronic Materials	
ELEG 5543	Introduction to Power Electronics	
MEEG 5263	Introduction to Micro Electro Mechanical Systems	
MEEG 5343	Computational Material Science	
MSEN 6323	Materials Engineering Design	
PHYS 5713	Condensed Matter Physics I	
PHYS 5734	Laser Physics	
PHYS 5753	Applied Nonlinear Optics	
PHYS 5773	Introduction to Optical Properties of Materials	
PHYS 6613	Quantum Optics	
PHYS 6713	Condensed Matter Physics II	

Requirements for M.S. in Materials Science with Nanoscale Materials and Devices Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this

catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates typically have completed a Bachelor of Science degree in the physical or natural sciences and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Science without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Science

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Science students:

- **Academic path:** Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without the Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- **Professional path:** Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.
- **Non-thesis path:** Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends

the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member from the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 5343 Computational Materials Science	3	3	3
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development	3	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0

MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5323 Applied On- Campus Collaborative Research with External Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	Applied in Ph.D. Curriculum	1	1
Additional Technical Elective	0	0	>=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	Not Available	Not Available	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Science degree set. Both the undergraduate department and the MSEN program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two,

students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Nanoscale Materials and Devices

Choose nine hours of the following:

9

CHEM 5443	Physical Chemistry of Materials
ELEG 5303	Introduction to Nanomaterials and Devices (Introduction to Nanomaterials and Devices)
MEEG 5333	Introduction to Tribology
MEEG 5343	Computational Material Science
MSEN 5713	Advanced Nanomaterials Chemistry

MSEN 5733L Fabrication at the Nanoscale

MSEN 6323 Materials Engineering Design

PHYS 5713 Condensed Matter Physics I

PHYS 5723 Physics at the Nanoscale

PHYS 5783 Physics of 2D Materials

PHYS 6713 Condensed Matter Physics II

Requirements for M.S. in Materials Science with Materials Modeling Concentration

Prerequisites to Degree Program: Applicants to the program must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Studies Committee of the Materials Science and Engineering program.

Candidates typically have completed a Bachelor of Science degree in the physical or natural sciences and candidates' academic backgrounds will be evaluated by the Graduate Studies Committee for suitability to the graduate program. To be admitted to graduate study in Materials Science without deficiency, candidates are required to have completed a math course sequence through differential equations and an introduction to quantum mechanics through courses such as PHYS 3603 Introduction to Modern Physics, PHYS 3613 Modern Physics, or CHEM 3504 Physical Chemistry I. Other undergraduate deficiencies may be identified during the evaluation process, and degree completion will be contingent on successful completion of these identified deficiencies.

Prospective students from foreign countries in which English is not the native language must submit nationally recognized standardized testing results on written English proficiency for consideration by the Graduate School during the admission process. Students may be given conditional admittance pending demonstration of English language skills in appropriate courses at the University of Arkansas. Students wishing to apply for graduate assistantships that require direct contact with students in a teaching or tutorial role must meet the Graduate School's English Language proficiency test requirements for such GA positions.

Requirements for the Master of Science in Materials Science

Degree: Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the MSEN Program Director to define their M.S. path to best support their career goals after graduation, with three curricula paths available to Materials Science students:

- Academic path: Students who plan to complete an academic campus-based research thesis will take this path, although the research topic may include funding and collaboration with outside technical organizations. Students who complete all requirements for M.S. graduation, including an independent research project and thesis acceptable to their thesis committee, will be eligible without the Graduate Studies Committee review for admission to the Ph.D. program in Materials Science and Engineering.
- Professional path: Students who plan to enter the technical marketplace after M.S. completion will find this path most beneficial as it requires independent graduate-level research in collaboration with an external technical organization. The research may be in the form of a traditional M.S. six-hour research topic and thesis, or may instead be in the form of two three-hour independent research efforts resulting in written reports with the clarity, style, analysis, and conclusions expected of a journal paper submission. Both the thesis and the written reports will be orally defended before the appropriate student committee. Students in this path will also be required to complete at

least one internship of at least six weeks duration to experience a non-academic technical environment. Students completing this path may be considered by the Graduate Studies Committee for admission to the Ph.D. program in Materials Science and Engineering based on the strength of their academic course grades, their independent research depth, and the quality of the written research document.

- Non-thesis path: Students who are funded by personal resources or by graduate assistantships not associated with research or educational grants may complete an M.S. degree with additional course work in place of independent research. While there may be specific narrow career options where this is an appropriate path, the Materials Science and Engineering program strongly recommends the Professional or Academic paths as providing a much better overall career preparation for working in a technical position. Students completing this path cannot be accepted into the Ph.D. program in Materials Science and Engineering.

Students will form either a thesis committee or an advisory committee after they have chosen their M.S. path, defined any independent research areas, and have been accepted into a research group if appropriate. A thesis committee will be made up of at least three faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering (the student's research professor will chair the thesis committee). The advisory committee will include at least one member from the Graduate Studies Committee, the supervising faculty member for a research experience, and one additional faculty member. If the student is in the Professional path, then either committee must also include at least one technical professional from the partner external organization as an adjunct faculty member or an ex officio committee member.

Students in this degree program can choose an Academic path, a Professional path, or a Non-thesis path. The course hours to meet the minimum requirements for each paths are as follows:

Subject Area	Academic Path/ Hours	Professional Path/Hours	Non-Thesis Path/Hours
MEEG 5343 Computational Materials Science	3	3	3
MEEG 591V Special Topics (Introduction to Manufacturing) (Core)	3	3	3
MSEN 5322 Materials Characterization (Core)	2	2	2
MSEN 5313 Fundamentals of Materials Science (Core)	3	3	3
MSEN 5383 Research Commercialization and Product Development	3	3	3

MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	4	4	4
Technical Electives from Concentration List	9	9	9
MSEN 600V Research Thesis	6	(Option) 6	0
MSEN 5513 Applied Research in External Technical Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 5323 Applied On- Campus Collaborative Research with External Organizations	Not Available	(Or Option) 3 + 3	Not Available
MSEN 555V Internship in External Technical Organization or GNEG 5811 Alternating Cooperative Education	Optional (hours do not apply to degree requirement)	>= 1	Optional (hours do not apply to degree requirement)
MSEN 5821 Ethics for Scientists and Engineers	Applied in Ph.D. Curriculum	1	1
Additional Technical Elective	0	0	>/=2
MSEN 5253 Emerging Technologies in Industry	Recommended in PhD studies	Recommended in PhD studies	3
MSEN 5393 Product Development Process	Not Available	Not Available	3

If a University of Arkansas undergraduate student is pursuing a Bachelor of Science degree in a department that has implemented an accelerated B.S./M.S. program (typically allowing six hours of graduate-level course work to be shared between the two degrees), the student may implement the same acceleration for a B.S. departmental degree/M.S. Materials Science degree set. Both the undergraduate department and the MSEN program Director must approve the shared courses prior to enrollment.

As part of each student's curriculum, nine hours of coursework must be taken through one of the following concentrations. Courses not listed in the concentration list, but clearly pertaining to the concentration area, may be substituted with the approval of the student's research adviser and the MSEN program Director. Students who have acquired the knowledge contained in any of the required courses through prior education may petition the MSEN program Director for permission to substitute other classes for these required courses.

Additional core courses to develop operations management skills also have been defined for MSEN students. During year one of their graduate studies at the University of Arkansas, students are required to take MSEN 5811 1st Year Operations Seminar - Infrastructure Management and MSEN 5911 1st Year Operations Seminar - Personnel Management in the fall and spring semesters and MSEN 5821 Ethics for Scientists and Engineers in their first summer. During year two, students are required to take MSEN 6811 2nd Year Operations Seminar - Management and Leadership and MSEN 6911 2nd Year Operations Seminar - Advanced Management and Leadership in the fall and spring semesters, respectively. Students who begin their graduate studies at the University of Arkansas during the spring semester will be required to take MSEN 5811 in the fall semester following their completion of MSEN 6911 or to take MSEN 5811 concurrently with MSEN 6811.

Students are required to attend monthly MSEN Research Communication Seminars during the first three semesters of their M.S. degree program, and will enroll in MSEN 5611 Research Communication Seminar of MS Students in their third semester. Students working more than 20 hours per week in a non-local technology-based professional position approved by the MSEN Director will not be required to be enrolled in this class or attend the monthly seminars as a condition for graduation.

Research thesis hours will be chosen from the student's research adviser's section (MSEN 600V) and will require a written thesis successfully defended in a comprehensive oral exam given by the thesis committee.

A research thesis is required for Academic path students, and is optional for Professional path students. Professional path thesis research must include direct collaboration with an external technical organization.

A student in the Professional path may substitute two Applied Research efforts for a thesis under MSEN 5513 (External location) or MSEN 5523 (Internal on-campus location), provided each semester's research is of graduate-level quality and is reported at the end of the semester through a written paper and in an oral presentation to the advisory committee (note that the written paper must match the clarity, style, analysis, and conclusions expected of a journal paper submission). Regardless of where the research is performed, it must include direct collaboration with an external technical organization.

If a student is taking either a special problems independent study course (such as MSEN 588V) or a special topics course (such as MSEN 587V) to meet partial requirements for their M.S. degree, the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Each student is required to enroll in at least one hour of course work each fall and spring semester until the M.S. degree is issued. If all required course work has been completed, the student may enroll in one hour of

master's thesis, or in one hour of a special problems course for credit only.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Concentration in Materials Modeling

Choose nine hours of the following:

9

CVEG 5383	Finite Element Methods in Civil Engineering
MEEG 5343	Computational Material Science
MEEG 5733	Advanced Numerical Methods
MSEN 6323	Materials Engineering Design
PHYS 5093	Applications of Group Theory to Physics
PHYS 5363	Scientific Computation and Numerical Methods
PHYS 5713	Condensed Matter Physics I
PHYS 6713	Condensed Matter Physics II

Requirements for Ph.D. in Materials Science and Engineering

Students choosing this degree program will be assigned an initial adviser upon acceptance to the program. Students will work with the Materials Science and Engineering Program Director to define their dissertation committee after they are accepted by a research faculty for a research project. This committee will be made up of at least four faculty members, with at least one faculty member each from the Fulbright College of Arts and Sciences and the College of Engineering. The student's research professor will chair the dissertation committee.

Candidates for the Ph.D. program are expected to have completed a Master of Science degree in either engineering or science, with each candidate's academic background being evaluated by the Graduate Studies Committee of the Materials Science and Engineering program. Doctoral candidates in Materials Science and Engineering are expected to have proficiency in the core curriculum of the Master of Science in Materials Engineering or Master of Science in Materials Science at the University of Arkansas. This core is described in the requirements for the Master of Science in Materials Engineering and the Master of Science in Materials Science, as well as in the handbook of the Materials Science & Engineering program and is the knowledge that will be tested in the Materials Science & Engineering specific candidacy exam administered in the spring semester of each academic year.

Students who have graduated with a Master of Science degree in Materials Engineering or a Master of Science degree in Materials Science from the University of Arkansas will be expected to take the Materials Science and Engineering written Ph.D. candidacy exam in the first spring semester after M.S. graduation. Students requesting admission to the Ph.D. program with a Master of Science degree from another institution or from another discipline will be required to take the Materials Science & Engineering written Ph.D. candidacy exam within four semesters after admission to the PhD program and after having completed MSEN 5383 Research Commercialization and Product Development.

A second part of the candidacy exam, a detailed Ph.D. research proposal, must be accepted by the student's committee before the end of the 24th month after the start date of the student's first semester as a Ph.D. student, or the student will be removed from the Ph.D. program. This research proposal is not linked to the written candidacy exam and may be presented to the committee any time in this 24 month period.

Students who fail to pass their written candidacy exam will have a joint consultation with their major professor and the MSEN Program Director to formulate a specific action plan to correct student deficiencies identified by the exam. The student will be allowed to retake the written exam only one additional time, which must be during the next scheduled written examination period.

A Ph.D. curriculum will be defined to meet each student's research interests as well as ensure the Materials Science and Engineering program's core courses have been taken. The course plan for each student must include a minimum of 27 hours of graduate coursework beyond the Master of Science degree requirements. Specific courses will be chosen by the student and must be approved by the student's major professor and the MSEN Program Director. The coursework list for the Ph.D degree will be dependent upon the MS degree with which the student enters the program:

Subject Area	M.S. in Materials Engineering or Materials Science from UA/Hours	M.S. in Materials Engineering or Materials Science from another institution/ Hours	Other Science or Engineering M.S. degrees/ Hours
MSEN 6313 Advanced Materials Science & Engineering	3	3	3
BENG 5703 Design and Analysis of Experiments for Engineering Research OR INEG 5333 Design of Industrial Experiments OR other Design of Experiments course	3	3	3
MSEN 5821 Ethics for Scientists and Engineers	1 (Applied from MS curriculum)	1	1
MSEN 6323 Materials Engineering Design	If not taken in MS curriculum	3	3
MSEN 5811 / MSEN 5911 / MSEN 6811 / MSEN 6911 Operations Management Seminar Series (Core)	Taken in MS curriculum	4	4

MSEN 5383 Research Commercialization and Product Development	Taken in MS curriculum	3	3
5000- and 6000-level elective courses in science and engineering	17-20	10	5
MEEG 591V Special Topics (Introduction to Manufacturing)	Taken in MS curriculum	Recommended elective	Recommended elective
MSEN 5322 Materials Characterization	Taken in MS curriculum	Recommended elective	2
MSEN 5313 Fundamentals of Materials Science	Taken in MS curriculum	Recommended elective	3
MSEN 5253 Emerging Technologies in Industry	Recommended elective	Recommended elective	Recommended Elective
MSEN 700V Dissertation	21	21	21
Total	48	48	48

If a student is taking either a special problems independent study course, such as MSEN 588V, or a special topics course, such as MSEN 587V, to meet partial requirements for their Ph.D. degree, then the instructor must supply the MSEN program office with a syllabus of that class to be included in their program records. The syllabus must include at least the course title, semester, instructor name, a list of specific course objectives, a list of student learning outcomes, sources of content knowledge, and method by which the student's mastery of the learning objectives is demonstrated.

Students are required to attend monthly Materials Science and Engineering Research Communication Seminars during the first five semesters of their Ph.D. degree program, and will enroll in MSEN 6611 Research Communication Seminar of PhD Students in their fifth semester.

The dissertation format must meet all Graduate School published guidelines and the MSEN guidelines as listed in the Materials Science and Engineering Graduate Student Handbook. A Ph.D. candidate wishing to use a compilation of published papers for the dissertation must receive explicit permission from the Graduate Studies Committee to use this style dissertation at least six months prior to his or her dissertation defense, with a meeting between the student's committee chair and the Graduate Studies Committee required before permission can be granted.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Ang, Simon S., Ph.D. (Southern Methodist University), M.S.E.E. (Georgia Institute of Technology), B.S.E.E. (University of Arkansas), Professor, Department of Electrical Engineering, 1988.

- Barraza-Lopez, Salvador**, Ph.D. (University of Illinois-Urbana-Champaign), B.S. (Instituto Politecnico Nacional de Mexico), Associate Professor, Department of Physics, 2011.
- Beitle, Robert R.**, Ph.D., M.S.Ch.E., B.S.Ch.E. (University of Pittsburgh), Professor, Ralph E. Martin Department of Chemical Engineering, 1993.
- Bellaiche, Laurent**, Ph.D., M.S., B.S. (University of Paris VI, France), Distinguished Professor, Department of Physics, 1999.
- Benamara, Mourad**, Ph.D., M.S. (University of Toulouse III, France), Assistant Professor, Nanotechnology, 2007.
- Beyzavi, M. Hassan**, Ph.D. (Freie Universität Berlin, Germany), Assistant Professor, Department of Chemistry and Biochemistry, 2017.
- Chen, Jingyi**, Ph.D. (University of Washington), M.A. (State University College at Buffalo), B.S. (Zhongshan University), Professor, Department of Chemistry and Biochemistry, 2010.
- Chen, Zhong**, Ph.D. (North Carolina State University), M.Eng. (National University of Singapore), B.S. (Zhejiang University), Assistant Professor, Department of Electrical Engineering, 2015.
- Churchill, Hugh O.H.**, Ph.D., A.M. (Harvard University), B.A. (Oberlin College), B.M. (Oberlin Conservatory of Music), Assistant Professor, Department of Physics, 2015.
- Coridan, Robert**, Ph.D., M.S. (University of Illinois-Urbana-Champaign), B.S. (The Ohio State University), Assistant Professor, Department of Chemistry and Biochemistry, 2015.
- Di, Jia**, Ph.D. (University of Central Florida), M.S., B.S. (Tsinghua University), Professor, Department of Computer Science and Computer Engineering, 2004.
- El-Shenawee, Magda O.**, Ph.D. (University of Nebraska-Lincoln), M.S., B.S. (Assiut University, Egypt), Professor, Department of Electrical Engineering, 2001.
- Fritsch, Ingrid**, Ph.D. (University of Illinois-Urbana-Champaign), B.S. (University of Utah), Professor, Department of Chemistry and Biochemistry, 1992.
- Fu, Huaxiang**, Ph.D., M.S. (Fudan University), B.S. (University of Science and Technology of China), Professor, Department of Physics, 2002.
- Gea-Banacloche, Julio R.**, Ph.D. (University of New Mexico), Licenciado en Ciencias Fisicas (Universidad Autonoma de Madrid), Professor, Department of Physics, 1989.
- Greenlee, Lauren F.**, Ph.D., M.S. (University of Texas, Austin), BSChE (University of Michigan), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 2015.
- Heyes, Colin David**, Ph.D. (Georgia Institute of Technology), B.S. (Loughborough University), Associate Professor, Department of Chemistry and Biochemistry, 2008.
- Hu, Jin**, Ph.D. (Tulane University), B.S. (University of Science and Technology of China), Assistant Professor, Department of Physics, 2017.
- Huitink, David**, Ph.D., M.S.M.E., B.S.M.E. (Texas A&M University), Assistant Professor, Department of Mechanical Engineering, 2016.
- Jensen, Morten O.**, Ph.D. (University of Aarhus, Denmark), M.Sc. (Georgia Institute of Technology), Associate Professor, Department of Biomedical Engineering, 2014.
- Kim, Jin-Woo**, Ph.D. (Texas A&M University), M.S. (University of Wisconsin-La Crosse), B.S. (University of Iowa), Professor, Department of Biological and Agricultural Engineering, 2001.
- Kumar, Pradeep**, Ph.D. (Boston University), M.Sc. (Indian Institute of Technology, Mumbai, India), Associate Professor, Department of Physics, 2013.
- Li, Jiali**, Ph.D., M.S. (City University of New York-City College), M.S. (University of Science and Technology of China), B.S. (Hei Long Jiang University), Professor, Department of Physics, 2002.
- Li, Yanbin**, Ph.D. (Pennsylvania State University), M.S. (University of Nebraska-Lincoln), B.S. (Shenyang Agricultural University), Distinguished Professor, Department of Biological and Agricultural Engineering, 1989.
- Manasreh, Bothina H.**, Ph.D., M.Sc. (University of Jordan), Research Assistant Professor, Department of Physics, 2017.
- Manasreh, Omar**, Ph.D. (University of Arkansas), M.S. (University of Puerto Rico-Rio Piedras), B.S. (University of Jordan), Professor, Department of Electrical Engineering, 2003.
- Mantooth, Alan**, Ph.D. (Georgia Institute of Technology), M.S., B.S. (University of Arkansas), Distinguished Professor, Department of Electrical Engineering, 1998.
- McCann, Roy A.**, Ph.D. (University of Dayton), M.S.E.E., B.S.E.E. (University of Illinois), Professor, Department of Electrical Engineering, 2003.
- Meng, Xiangbo**, Ph.D. (University of Western Ontario), M.S.E.E. (China University of Petroleum), B.S.C.E. (Northwestern University), Assistant Professor, Department of Mechanical Engineering, 2016.
- Millett, Paul**, Ph.D., M.S. (University of Arkansas), B.E. (Vanderbilt University), Associate Professor, Department of Mechanical Engineering, 2013.
- Moradi, Mahmoud**, Ph.D. (North Carolina State University), M.S., B.S. (Sharif University of Technology), Assistant Professor, Department of Chemistry and Biochemistry, 2015.
- Nair, Arun**, Ph.D. (Virginia Polytechnic State University), M.S. (Colorado State University), B.T. (Mahatma Gandhi University), Associate Professor, Department of Mechanical Engineering, 2013.
- Nakamura, Hiroyuki**, Ph.D., M.S., B.S. (University of Tokyo), Assistant Professor, Department of Physics, 2019.
- Naseem, Hameed A.**, Ph.D., M.S. (Virginia Polytechnic State University), M.Sc. (Panjab University), University Professor, Department of Electrical Engineering, 1985.
- Oliver, William**, Ph.D., M.S. (University of Colorado-Boulder), B.S. (University of Arizona), Associate Professor, Department of Physics, 1992.
- Pohl, Edward A.**, Ph.D., M.S.R.E. (University of Arizona), M.S.S.E. (Air Force Institute of Technology), M.S.E.M. (University of Dayton), B.S.E.E. (Boston University), Professor, Department of Industrial Engineering, 2004.
- Porter, Errol**, M.S.E.E., B.S.E.E. (University of Arkansas), Research Associate, Microelectronics-Photonics, 1997.
- Salamo, Gregory J.**, Ph.D. (City University of New York), M.S. (Indiana University-Purdue University-Indianapolis), B.S. (City University of New York, Brooklyn College), Distinguished Professor, Department of Physics, 1975.
- Selvam, R. Panneer**, Ph.D. (Texas Tech University), M.S.C.E. (South Dakota School of Mines and Technology), M.E., B.E. (University of Madras, India), University Professor, Department of Civil Engineering, 1986.
- Servoss, Shannon**, Ph.D. (Northwestern University), B.S.Ch.E. (University of Michigan-Ann Arbor), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 2007.
- Singh, Surendra P.**, Ph.D., M.A. (University of Rochester), M.Sc., B.Sc. (Banaras Hindu University, India), University Professor, Department of Physics, 1982.
- Stenken, Julie A.**, Ph.D. (University of Kansas), B.S. (University of Akron), Professor, Department of Chemistry and Biochemistry, 2007.
- Tian, Ryan**, Ph.D. (University of Connecticut), B.S. (Fudan University, Shanghai), Associate Professor, Department of Chemistry and Biochemistry, 2004.
- Tung, Steve**, Ph.D., M.S.M.E. (University of Houston), B.S.M.E. (National Taiwan University), Professor, Department of Mechanical Engineering, 2000.
- Wang, Feng**, Ph.D. (University of Pittsburgh), Ph.D. (Kutztown University of Pennsylvania), Associate Professor, Department of Chemistry and Biochemistry, 2012.

Wang, Yong, Ph.D., M.S. (University of California, Los Angeles), B.S. (University of Science and Technology of China), Assistant Professor, Department of Physics, 2016.

Ware, Morgan, Ph.D. (North Carolina State University), B.S. (Florida State University), Assistant Professor, Department of Electrical Engineering, 2005.

Wejinya, Uchechukwu C., Ph.D., M.S., B.S. (Michigan State University), Associate Professor, Department of Mechanical Engineering, 2008.

Wickramasinghe, Ranil, Ph.D. (University of Minnesota-Twin Cities), M.S., B.S. (University of Melbourne, Australia), Professor, Ralph E. Martin Department of Chemical Engineering, 2011.

Wise, Rick, Ph.D., M.S. (Southern Methodist University), B.S. (University of Arkansas), Research Professor, Department of Physics, 2014.

Xiao, Min, Ph.D. (University of Texas at Austin), B.S. (Nanjing University), Distinguished Professor, Department of Physics, 1990.

Yu, Fisher, Ph.D. (Arizona State University), M.S., B.S. (Peking University), Associate Professor, Department of Electrical Engineering, 2008.

Zhou, Wenchao, Ph.D. (Georgia Institute of Technology), M.S.M.E. (Xi'an Jiaotong University, Xi'an, China), B.S.M.E. (Huazhong University of Science and Technology, Wuhan, China), Assistant Professor, Department of Mechanical Engineering, 2014.

Zou, Min, Ph.D., M.S.M.E. (Georgia Institute of Technology), M.S.A.E., B.S.A.E. (Northwestern Polytechnical University), Professor, Department of Mechanical Engineering, 2003.

Courses

MSEN 5253. Emerging Technologies in Industry. 3 Hours.

Business leaders present technologies used by their companies. Focusing on Arkansas-based companies, technology needs for the industry and innovative ideas for solutions or advancements are discussed. Students work to develop solutions to address company needs or further develop a company's current technology. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

MSEN 5313. Fundamentals of Materials Science. 3 Hours.

Fundamentals of Materials Science provides an overview of materials science and engineering and is foundational for graduate study in the field. The structures of materials at the atomic scale, nanoscale, microscale, and macroscale are studied and the impact of this organization of matter on its physical and chemical properties are examined. Principles for measurement and characterization of material structure and properties are introduced. Emphasis is placed on materials important for use for electronic, photonic, energy, and biological applications. Advances in nanoscale materials as established fundamentals of macroscale structural materials are covered. Prerequisite: Graduate standing or consent of the instructor. (Typically offered: Fall)

MSEN 5322. Materials Characterization. 2 Hours.

Lecture and hands-on experience for using characterization tools to study the properties of materials. Techniques covered will include x-ray diffraction, x-ray photoelectron spectroscopy, scanning electron microscope, transmission electron microscope, and others. Use of these techniques for studies of material failure and reliability will also be examined. Corequisite: Lab component. Prerequisite: MSEN 5313 or instructor consent. (Typically offered: Fall)

MSEN 5383. Research Commercialization and Product Development. 3 Hours.

This survey course examines research commercialization through analysis of IP, technology space, market space, manufacturability, financials, and business plans. Entrepreneurial behaviors and product development within large companies are also discussed. A case study using a current UA faculty member's research commercialization effort will be developed. Prerequisite: Graduate Standing. (Typically offered: Spring)

MSEN 5393. Product Development Process. 3 Hours.

Demonstration of a student's technical and management knowledge integration by creating a commercially viable product development process to meet a new societal need, with the technical solution based on micro to nanoscale technology. Final grade based on a detailed written report and oral presentation to a panel. Non-thesis students only. Pre- or Corequisite: MSEN 5383. Prerequisite: Instructor permission. (Typically offered: Spring)

MSEN 5513. Applied Research in External Technical Organizations. 3 Hours.

A one semester narrow focus graduate level research effort while working at an external technical organization's site. Requires a final report of style and quality suitable for journal submission. This course available only to Professional Path M.S. MSEN students, and may substitute for an MSEN 588V External Internship. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MSEN 5523. Applied On-Campus Collaborative Research with External Technical Organizations. 3 Hours.

A one semester narrow focus graduate level on-campus research effort performed in collaboration with an external technical organization. Requires a final report of style and quality suitable for journal submission. This course available only to Professional Path M.S. MSEN students. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MSEN 555V. Internship in External Technical Organization. 1-3 Hour.

Used to document a MSEN grad student internship experience in an external technical organization for a minimum duration of six weeks (6-9 weeks=one hour, 10-12 weeks=two hours, and 13-15 weeks=three hours). It may not be used to meet the research requirements of a M.S. degree. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

MSEN 5611. Research Communication Seminar of MS Students. 1 Hour.

This course serves as a forum for MS students to develop oral presentation skills and to exchange research ideas. Research presentations will be on various topics in the area of micro to nanoscale materials, processing, and devices, with research management and planning also being addressed. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

MSEN 5713. Advanced Nanomaterials Chemistry. 3 Hours.

Science and engineering graduates are using more nanomaterials, and modern industry demands that its scientists and engineers have materials chemistry knowledge. Materials from the micro to nanoscale will be examined in this course from the perspective of fundamental chemistry principles to build a picture of tomorrow's materials. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MSEN 5733L. Fabrication at the Nanoscale. 3 Hours.

This hands-on lab course will cover the disciplines needed to make active electronic and photonic devices utilizing nanoscale structures and fabrication techniques presently used in research and industry. Prerequisite: Graduate standing and permission of the instructor. (Typically offered: Spring)

MSEN 5811. 1st Year Operations Seminar - Infrastructure Management. 1 Hour.

Weekly seminar for 1st year Materials Science and Engineering graduate students to discuss issues that increase professional performance in technology-centered organizations. The discussions will focus on issues that affect organizational infrastructure, career planning, organizational structures, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Fall)

MSEN 5821. Ethics for Scientists and Engineers. 1 Hour.

This course will introduce methods useful in the practice of ethical decision making in the high technology academic and industrial work place. An emphasis will be placed on applying the methods discussed in the text to student and instructor past professional experiences. Prerequisite: Graduate standing. (Typically offered: Summer)

MSEN 587V. Special Topics in Materials Science and Engineering. 1-4 Hour.

Consideration of current materials science and engineering topics not covered in other courses. One section will be created for each topic only after a syllabus is submitted to the MSEN office by the faculty member teaching the course. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

MSEN 588V. Special Problems in Materials Science and Engineering. 1-3 Hour.

Opportunity for individual study of advanced subjects related to a graduate degree in Materials Science and Engineering to suit individual requirements. One section will be created for each student only after a syllabus is submitted to the MSEN office by the supervising faculty member. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MSEN 5911. 1st Year Operations Seminar - Personnel Management. 1 Hour.

Weekly seminar for 1st year Materials Science and Engineering graduate students to discuss issues that increase professional performance in technology-centered organizations. The discussions will focus on issues that affect personnel management, team building and structures, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Spring)

MSEN 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MSEN 626V. Emerging Technologies in Industry Practicum. 1-3 Hour.

Students engage in demand-driven research projects inspired by Arkansas companies as part of the interdisciplinary IGNITE (Industry Generating New Ideas and Technology through Education) program. These projects, which often result from interactions with companies during MSEN 5253, include visiting company locations; developing project goals, budgets, and timelines; and performing research. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

MSEN 6313. Advanced Materials Science and Engineering. 3 Hours.

This course will introduce students to the core principles of the design, nature and processing of advanced materials and the mechanisms of failure of materials. The course also integrates materials behavior and materials processing relevant to a wide range of industrial sectors while it covers traditional structural materials, functional materials, nanomaterials and biomaterials. Students learn to achieve enhanced functionality through convergence and integration of biological, organic, electronic, and structural materials; self-assembly creation of new materials; and tailoring of interfaces to produce nanocomposites. In this way, it will provide students with a depth of core knowledge and skills allowing students to make informed choices concerning applications, selection and design of advanced materials. Prerequisite: MSEN 5313 or permission of the Instructor. (Typically offered: Spring)

MSEN 6323. Materials Engineering Design. 3 Hours.

This course will provide concrete training on the generation of a sound prototype design and R&D plan, in addition to the generation of a quality proposal based on specific federal solicitation criteria. Finally, each student will pick a topic/prototype for which they will prepare a full preliminary design, R&D plan and federal grant proposal from a list of real, suitable topics. The students will be required to follow the specific topic/solicitation instructions provided by the federal agency supporting the research. Prerequisite: Graduate standing or consent of the instructor. (Typically offered: Fall)

MSEN 6611. Research Communication Seminar of PhD Students. 1 Hour.

This course serves as a forum for Ph.D. students to develop oral presentation skills and to exchange research ideas. Research presentations will be on various topics in the area of materials, processing, and devices, with research management and planning also being addressed. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

MSEN 6811. 2nd Year Operations Seminar - Management and Leadership. 1 Hour.

Weekly seminar for 2nd year Materials Science and Engineering graduate students to discuss issues that increase professional performance in technology-centered organizations. The discussions will focus on issues that affect management and leadership effectiveness and efficiency, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Fall)

MSEN 6911. 2nd Year Operations Seminar - Advanced Management and Leadership. 1 Hour.

Weekly seminar for 2nd year Materials Science and Engineering graduate students to discuss advanced issues that increase professional performance in technology-centered organizations. The discussions will focus on the complex issues that affect management and leadership effectiveness and efficiency, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Spring)

MSEN 700V. Doctoral Dissertation. 1-21 Hour.

Doctoral dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Mathematical Sciences (MASC)

Mark Johnson
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Department of Mathematical Sciences Website (<http://fulbright.uark.edu/departments/math/>)

Degrees Conferred:

M.S., Ph.D. (MATH)
M.A. in Secondary Mathematics (SMTH)

Areas of Study: Mathematics and secondary mathematics for instructors planning to teach mathematics at the high school level.

Primary Areas of Faculty Research: Analysis, algebra, geometric topology, numerical analysis, statistics.

M.S. in Mathematics

Prerequisites to Degree Program: Prospective candidates for the Master of Science degree in Mathematics are expected to have completed a program equivalent to that required by the department for a B.S. degree, as set forth in the current catalog of the Fulbright College of Arts and Sciences. Deficiencies may be removed either by taking the appropriate undergraduate courses or by examination. In addition to the application for admission to the Graduate School and the transcripts required for Graduate School admission, applicants for admission to the degree programs of the Department of Mathematical Sciences must submit a) three letters of recommendation from persons familiar with the applicant's previous academic and professional performance and b) official scores from the Graduate Record Examination (General Test).

The degree of Master of Science is intended for collegiate teachers of mathematics, non-teaching professional mathematicians, and those who desire to continue advanced study.

Requirements for the Master of Science Degree: This degree is offered under three separate options: a general option, a computational mathematics option, and a thesis option. The general and thesis options are intended for students who plan to be collegiate teachers of mathematics, continue advanced study in mathematics, or obtain a broad background for preparation as a non-teaching professional mathematician. The computational mathematics option is intended for students who intend to specialize in computational and applied mathematics in preparation for professional employment in an interdisciplinary or computationally intensive environment.

The program of a candidate will be determined in conference with the candidate's graduate adviser. A comprehensive examination must be passed by each candidate for the Master of Science degree. It should be taken near the end of the last semester of residence. At least four weeks prior to the scheduled date, students must notify the department of their intention to take the examination. No student may take the comprehensive examination more than three times. MATH 504V, MATH 507V, MATH 5013, and MATH 5033 are not applicable to the Master of Science degree in mathematics. The program will include at least two semesters of one-hour credit in MATH 510V Mathematics Seminar.

All candidates must complete a minimum of 32 semester hours of approved graduate course work, including 12 semester hours in mathematics at the 5000-6000 level (excluding MATH 510V). All selected courses are subject to the approval of the Graduate Committee.

Students in the general option may include up to nine semester hours of graduate work in courses outside the department. The comprehensive examination for the general option will be a written exam including material covered in graduate course work.

The candidate for the computational mathematics option must include at least six but not more than twelve semester hours of graduate work in courses outside of mathematics. The comprehensive examination for the computational mathematics option will be similar to the examination for the general option but must include material covered in six semester hours of MATH 5393 (formerly MATH 4353) and MATH 5383 (formerly MATH 4363).

Students in the thesis option must complete 6 semester hours of MATH 610V with the candidate's thesis adviser, which will count toward the 32 semester hours of approved graduate course work. In addition to a written comprehensive exam, the candidate will be required to complete an oral defense of the thesis. Reading copies of the thesis should be delivered to members of the Thesis Committee at least three weeks prior to undertaking the final examination.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.A. in Secondary Mathematics

Requirements for the Master of Arts Degree with a Major in Secondary Mathematics: This program is designed for secondary school teachers of mathematics. It requires 30 semester hours of graduate work.

Prospective candidates for the Master of Arts degree in secondary mathematics are expected to have earned a baccalaureate degree or equivalent with a major in a mathematical science (mathematics,

statistics, operations research, or computer science), engineering, or a physical science, and credit in courses equivalent to MATH 2564, MATH 3083, MATH 3113, and MATH 3773.

The program has four components in which to earn a minimum of 30 semester hours of credit:

1. Graduate course work in mathematics content and content-based pedagogy. At least 12 hours of credit in graduate course work specifically designed for preparation for teaching secondary mathematics. The content will include probability and statistics, algebra, geometry, and advanced calculus with connections to secondary school mathematics. At least one of the courses must be in probability and statistics; one in algebra; and one in advanced calculus. These courses are to be selected from:

MATH 5013	Abstract Algebra with Connections to School Mathematics	3
MATH 5023	Geometry with Connections to School Mathematics	3
MATH 5033	Advanced Calculus with Connections to School Mathematics Teaching	3
MATH 5053	Probability & Statistics with Connections to School Mathematics	3
MATH 504V	Special Topics for Teachers	1-6

Other graduate mathematics or statistics courses may be used in place of these courses with the approval of the student's committee.

2. Independent study and research in mathematics or mathematics education. Up to six hours of credit is available in independent study and research under the direction of mathematical sciences faculty. The results will be evidenced by a report roughly equivalent to a master's thesis.
3. Advanced work in professional teacher preparation. Up to six hours of credit in MATH 507V is available for advanced work in preparation for teaching AP calculus, AP statistics, International Baccalaureate (IB) mathematics, or for achieving National Board Certification in (Adolescence and Young Adulthood) Mathematics. Other professional development activities with quality control features similar to those of the AP, IB, and National Board programs may be presented for consideration for credit. All such work must be sanctioned by the sponsoring organizations.
4. Graduate courses in education. Up to six hours of credit is available in graduate courses in education. The student's committee must approve the courses. Recommended courses include:

CIED 6013	Curriculum Theory, Development, and Evaluation	3
CIED 6043	Analysis of Teacher Education	3
CIED 6053	Curriculum and Instruction: Learner Assessment and Program Evaluation	3

Other graduate courses in education may be used in place of these courses with the approval of the student's advisory committee.

If allowed by Graduate School rules, credit previously earned may be applied to the requirements for this degree with the approval of the student's advisory committee.

Each person receiving the Master of Arts degree in secondary mathematics must pass a written examination in three of the following

areas: probability and statistics; algebra; geometry; advanced calculus; and mathematics education. No student will be allowed to take the examination more than three times. Candidates will also present a portfolio describing the body of work with samples of their work as students and explanations of connections to secondary school mathematics.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Mathematics

Requirements for the Doctor of Philosophy Degree: Candidates for the degree of Doctor of Philosophy with a major in mathematics will be required to earn not less than 60 semester hours of course credit beyond the bachelor's degree in mathematics and closely related fields. The number of hours and the courses for each student will be determined by the advisory committee. The candidate must fulfill the course requirements for the Master of Science degree in mathematics.

The basic requirement for the Ph.D. degree is the preparation of an acceptable dissertation. This dissertation must demonstrate the candidate's ability to do independent, original, and significant work in mathematics. It is required that this dissertation possess the degree of excellence of research papers ordinarily published in the leading mathematical journals.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

A comprehensive examination is given each year during the weeks preceding the beginning of the fall and spring semesters. This examination is taken by all students in the graduate program who have completed the course requirements for the M.S. degree. The prospective candidate for the Ph.D. will be allowed to take the examination at most three times. A third failure to qualify eliminates a student from the graduate program in mathematics. After qualifying, a candidacy examination will be given covering the intended areas of specialization beyond the level of the qualifying comprehensive examination. It may be repeated once.

Students who wish to specialize in mathematics education must complete four education graduate courses to study quantitative methods in education research and qualitative methods in education research. The recommended courses are ESRM 6413, ESRM 6423, ESRM 6533, and ESRM 6653, although these may be altered depending on the student's previous study of STAT courses. Students must complete 15 hours of independent study in mathematics education to prepare for dissertation research. The areas of this study are: K-14 curriculum; learning theory; art of teaching and teacher education; and assessment and technology. The 15 hours must include a three-hour research project that will result in a pre-dissertation research report.

In addition to extending knowledge by personal reading and research, a doctoral graduate in mathematics will normally communicate knowledge to others. Therefore each student in the Ph.D. program is required to acquire the equivalent of one semester of full-time experience in teaching; this requirement may be fulfilled by part-time experience over several semesters. Typically, teaching assistantship appointments will satisfy this requirement, but other similar experience may qualify as approved by the department.

Graduate Faculty

- Akeroyd, John R.**, Ph.D., M.A. (Indiana University at Bloomington), B.A. (University of Louisville), Professor, 1986.
- Arnold, Mark E.**, Ph.D., B.S. (Northern Illinois University), A.S. (Rock Valley College), Associate Professor, 1993.
- Barton, Ariel**, Ph.D., M.S. (University of Chicago), B.S. (Harvey Mudd College), Assistant Professor, 2016.
- Bradshaw, Zachary**, Ph.D. (University of Virginia), B.S. (Virginia Commonwealth University), Assistant Professor, 2017.
- Brewer, Dennis W.**, Ph.D., M.A. (University of Wisconsin), B.A. (Sterling College), Professor, 1975.
- Chakraborty, Avishek**, Ph.D. (Duke University), M.S., B.S. (Indian Statistical Institute), Assistant Professor, 2014.
- Clay, Matt**, Ph.D., M.S. (University of Utah), B.S. (University of Oregon), Associate Professor, 2012.
- Datta, Jyotishka**, Ph.D. (Purdue University), M.Stat., B.Stat. (Indian Statistical Institute, Kolkata, India), Assistant Professor, 2016.
- Day, Matthew B.**, Ph.D., M.S. (University of Chicago), B.S. (University of Texas), Associate Professor, 2011.
- Dingman, Shannon Wayne**, Ph.D., M.S. (University of Missouri-Columbia), M.S. (Pittsburg State University), Associate Professor, 2007.
- Feldman, William A.**, Ph.D. (Queen's University), M.S. (Northwestern University), B.S. (Tufts University), Professor, 1971.
- Goodman-Strauss, Chaim**, Ph.D., B.S. (University of Texas at Austin), Professor, 1994.
- Harrington, Phil**, Ph.D., M.S. (University of Notre Dame), B.S. (Whitworth College), Professor, 2009.
- Harriss, Edmund O.**, Ph.D. (Imperial College, London), M.M. (University of Warwick), Clinical Assistant Professor, 2010.
- Johnson, Mark**, Ph.D. (Michigan State University), M.S. (Purdue University), B.S. (City University of New York, Brooklyn College), Professor, 1995.
- Kaman, Tulin**, Ph.D. (Stony Brook University), M.S. (Istanbul Technical University), B.S. (Yildiz Technical University), Assistant Professor, 2017.
- Luecking, Daniel H.**, Ph.D., M.S., B.A. (University of Illinois-Urbana-Champaign), Professor, 1981.
- Mantero, Paolo**, Ph.D. (Purdue University), M.Sc., B.Sc. (University of Genova, Italy), Assistant Professor, 2015.
- Miller, Lance E.**, Ph.D. (University of Connecticut), M.S. (New Mexico State University), Associate Professor, 2013.
- Namakshi, Nama**, Ph.D., M.Ed. (Texas State University), B.S. (Angelo State University), Teaching Assistant Professor, 2016.
- Niu, Wenbo**, Ph.D. (University of Illinois at Chicago), M.S., B.S. (Fudan University, China), Assistant Professor, 2015.
- Petris, Giovanni**, Ph.D., M.S. (Duke University), B.S. (Universita degli Studi di Milano, Italy), Professor, 1999.
- Raich, Andrew Seth**, Ph.D., M.A. (University of Wisconsin-Madison), B.A. (Williams College), Professor, 2008.
- Rieck, Yo'av**, Ph.D. (University of Texas at Austin), B.A. (Israel Institute of Technology), Professor, 2000.
- Robinson, Samantha**, Ph.D., M.S., B.S. (University of Arkansas), Teaching Assistant Professor, 2015.
- Ryan, John**, Ph.D. (University of York), M.Sc. (University of Warwick), B.A. (University of York, Britain), Distinguished Professor, 1990.
- Tjani, Maria**, Ph.D. (Michigan State University), M.S. (Purdue University), B.S. (University of Ioannina, Greece), Associate Professor, 2003.
- Van Horn-Morris, Jeremy**, Ph.D. (University of Texas at Austin), B.S. (University of Oregon), Associate Professor, 2012.
- Woodland, Janet C.**, Ph.D., M.A. (State University of New York at Stony Brook), B.A. (King's College), Teaching Assistant Professor, 1993.

Zhang, Qingyang, Ph.D. (Northwestern University), M.S. (Loyola University–Chicago), B.S. (Beijing Normal University), Assistant Professor, 2015.

Courses

MATH 5013. Abstract Algebra with Connections to School Mathematics. 3 Hours.

Basic structures of abstract algebra (rings, fields, groups, modules and vector spaces) with emphasis on rings and fields as generalizations of the ring of integers and field of rational numbers. Graduate degree credit will not be awarded for both MATH 4113 (or MATH 5123) and MATH 5013. Prerequisite: Graduate standing or departmental consent. (Typically offered: Irregular)

MATH 5023. Geometry with Connections to School Mathematics. 3 Hours.

School geometry from an advanced perspective including conformity to the Common Core State Standards for Mathematics. Study will include historical developments and geometry based on transformations of two- and three-dimensional space. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

MATH 5033. Advanced Calculus with Connections to School Mathematics Teaching. 3 Hours.

Rigorous development of the real numbers, continuity, differentiation, and integration. Graduate degree credit will not be awarded for both MATH 4513 (or MATH 5503) and MATH 5033. Prerequisite: Departmental consent. (Typically offered: Irregular)

MATH 504V. Special Topics for Teachers. 1-6 Hour.

Current topics in mathematics of interest to secondary school teachers. Prerequisite: Graduate standing or departmental consent. (Typically offered: Irregular) May be repeated for degree credit.

MATH 5053. Probability & Statistics with Connections to School Mathematics. 3 Hours.

An advanced perspective of probability and statistics as contained in the high school mathematics curriculum with connections to other components of school mathematics. The content is guided by the content of the high school probability and statistics of the Common Core State Standards for Mathematics. Prerequisite: Graduate standing. (Typically offered: Spring)

MATH 507V. Professional Development for Secondary Mathematics Teaching. 1-6 Hour.

Validated participation in professional development mathematics workshops or institutes sanctioned by national or international educational organizations such as the College Board, International Baccalaureate Program, and the National Board for Professional Teaching Standards. Prerequisite: Enrollment in Secondary Mathematics Teaching, MA degree program or departmental consent. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MATH 510V. Mathematical Seminar. 1-3 Hour.

Members of the faculty and advanced students meet for presentation and discussion of topics. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

MATH 5113. Introduction to Abstract Algebra II. 3 Hours.

(Formerly MATH 4113.) Topics in abstract algebra including finite abelian groups, linear groups, factorization in commutative rings and Galois theory. Graduate degree credit will not be given for both MATH 4113 and MATH 5113. Prerequisite: MATH 3113. (Typically offered: Spring)

MATH 5123. Algebra I. 3 Hours.

What the beginning graduate student should know about algebra: groups, rings, fields, modules, algebras, categories, homological algebra, and Galois Theory. Prerequisite: MATH 3113, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5133. Algebra II. 3 Hours.

Continuation of MATH 5123. Prerequisite: MATH 5123, and graduate standing in mathematics or statistics. (Typically offered: Spring)

MATH 5153. Advanced Linear Algebra. 3 Hours.

(Formerly MATH 4103.) Linear functionals, matrix representation of linear transformations, scalar product, and spectral representation of linear transformations. Graduate degree credit will not be given for both MATH 4103 and MATH 5153. Prerequisite: Graduate standing. (Typically offered: Fall)

MATH 5163. Dynamic Models in Biology. 3 Hours.

(Formerly MATH 4163.) Mathematical and computational techniques for developing, executing, and analyzing dynamic models arising in the biological sciences. Both discrete and continuous time models are studied. Applications include population dynamics, cellular dynamics, and the spread of infectious diseases. Graduate degree credit will not be given for both MATH 4163 and MATH 5163. Prerequisite: MATH 2554. (Typically offered: Irregular)

MATH 5213. Advanced Calculus I. 3 Hours.

(Formerly MATH 4513.) The real and complex number systems, basic set theory and topology, sequences and series, continuity, differentiation, and Taylor's theorem. Emphasis is placed on careful mathematical reasoning. Graduate degree credit will not be given for both MATH 4513 and MATH 5213. Prerequisite: Graduate standing. (Typically offered: Fall)

MATH 5223. Advanced Calculus II. 3 Hours.

(Formerly MATH 4523.) The Riemann-Stieltjes integral, uniform convergence of functions, Fourier series, implicit function theorem, Jacobians, and derivatives of higher order. Graduate degree credit will not be given for both MATH 4523 and MATH 5223. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513). (Typically offered: Spring)

MATH 525V. Internship in Professional Practice. 1-3 Hour.

(Formerly MATH 405V.) Professional work experience involving significant use of mathematics or statistics in business, industry or government. Graduate degree credit will not be given for both MATH 405V and MATH 525V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

MATH 5263. Symbolic Logic I. 3 Hours.

(Formerly MATH 4253.) Rigorous analyses of the concepts of proof, consistency, equivalence, validity, implication, and truth. Full coverage of truth-functional logic and quantification theory (predicate calculus). Discussion of the nature and limits of mechanical procedures (algorithms) for proving theorems in logic and mathematics. Informal accounts of the basic facts about infinite sets. Graduate degree credit will not be given for both MATH 4253 and MATH 5263. Prerequisite: MATH 2603, MATH 2803, or PHIL 2203. (Typically offered: Fall)
This course is cross-listed with PHIL 5253.

MATH 5303. Ordinary Differential Equations. 3 Hours.

Existence, uniqueness, stability, qualitative behavior, and numerical solutions. Prerequisite: MATH 2584 and MATH 4513, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5313. Partial Differential Equations. 3 Hours.

Laplace's equation, Heat equation, Wave Equation, Method of Characteristics. Prerequisite: MATH 4423, MATH 4513, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5323. Partial Differential Equations II. 3 Hours.

Fourier Transforms, Sobolev Spaces, Elliptic Regularity. Prerequisite: MATH 5313 and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

MATH 5353. Mathematical Modeling. 3 Hours.

(Formerly MATH 4153.) Mathematical techniques for formulating, analyzing, and criticizing deterministic models taken from the biological, social, and physical sciences. Techniques include graphical methods, stability, optimization, and phase plane analysis. Graduate degree credit will not be given for both MATH 4153 and MATH 5353. Prerequisite: MATH 2584. (Typically offered: Irregular)

MATH 5363. Scientific Computation and Numerical Methods. 3 Hours.

An introduction to numerical methods used in solving various problems in engineering and the sciences. May not earn credit for this course and MATH 4353 or MATH 4363. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

This course is cross-listed with PHYS 5363.

MATH 5373. Finite Element Methods and Solution of Sparse Linear. 3 Hours.

Provides an in-depth understanding of numerical methods for the solution of partial differential equations using Finite Element Methods, Direct and Iterative Methods for the Sparse Linear Systems. Prerequisite: MATH 5393. (Typically offered: Spring)

MATH 5383. Numerical Analysis. 3 Hours.

(Formerly MATH 4363.) General iterative techniques, error analysis, root finding, interpolation, approximation, numerical integration, and numerical solution of differential equations. Graduate degree credit will not be given for both MATH 4363 and MATH 5383. Prerequisite: Graduate standing. (Typically offered: Fall)

MATH 5393. Numerical Linear Algebra. 3 Hours.

(Formerly MATH 4353.) Numerical methods for problems of linear algebra, including the solution of very large systems, eigenvalues, and eigenvectors. Graduate degree credit will not be given for both MATH 4353 and MATH 5393. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is equivalent to MATH 4353.

MATH 5403. Numerical Linear Algebra II. 3 Hours.

Provides an in-depth understanding of numerical methods for the solution of large scale eigenvalue problems arising in science and engineering applications including theory, implementation and applications. Prerequisite: MATH 5393. (Typically offered: Fall)

MATH 5423. Introduction to Partial Differential Equations. 3 Hours.

Matrices, Fourier analysis, and partial differential equations. Does not count towards degree credit in MATH. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

MATH 5443. Complex Variables. 3 Hours.

(Formerly MATH 4443.) Complex analysis, series, and conformal mapping. Graduate degree credit will not be given for both MATH 4443 and MATH 5443. Prerequisite: MATH 2603 or MATH 2803, and MATH 2584 or MATH 2584C. (Typically offered: Fall)

MATH 5453. Functional Analysis I. 3 Hours.

Banach Spaces, Hilbert Spaces, operator theory, compact operators, dual spaces and adjoints, spectral theory, Hahn-Banach, open mapping and closed graph theorems, uniform boundedness principle, weak topologies. Prerequisite: MATH 5513, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring Odd Years)

MATH 5503. Theory of Functions of a Real Variable I. 3 Hours.

Real number system, Lebesgue measure, Lebesgue integral, convergence theorems, differentiation of monotone functions, absolute continuity and the fundamental theorem of calculus L^p spaces, Holder and Minkowski inequalities, and bounded linear functionals on the L^p spaces. Prerequisite: MATH 4523 or MATH 5223 (formerly MATH 4523), and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5513. Theory of Functions of a Real Variable II. 3 Hours.

Measure and integration on abstract measure spaces, signed measures, Hahn decomposition, Radon-Nikodym theorem, Lebesgue decomposition, measures on algebras and their extensions, product measures, and Fubini's theorem. Prerequisite: MATH 5503, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

MATH 5523. Theory of Functions of a Complex Variable I. 3 Hours.

Complex numbers, analytic functions, power series, complex integration, Cauchy's Theorem and integral formula, maximum principle, singularities, Laurent series, and Mobius maps. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513). (Typically offered: Fall)

MATH 5533. Theory of Functions of a Complex Variable II. 3 Hours.

Riemann Mapping Theorem, analytic continuation, harmonic functions, and entire functions. Prerequisite: MATH 5523, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

MATH 5603. Differential Geometry. 3 Hours.

(Formerly MATH 4503.) Topics include: classical differential geometry of curves and surfaces in 3-space, differential forms and vector fields. Graduate degree credit will not be given for both MATH 4503 and MATH 5603. Prerequisite: MATH 2574 or MATH 2574C. (Typically offered: Irregular)

MATH 5703. Topology I. 3 Hours.

An introduction to topology. Topics include metric spaces, topological spaces and general point-set topology, homotopy and the fundamental group, covering spaces, the classification of surfaces. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513), and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall Even Years)

MATH 5713. Topology II. 3 Hours.

The continuation of Topology I. Topics include: advanced homotopy and covering spaces, the Seifert-van Kampen theorem, homology and the Mayer-Vietoris sequence. Prerequisite: MATH 5703, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring Odd Years)

MATH 5723. Differential Topology I. 3 Hours.

An introduction to the topology of smooth manifolds: applications of the inverse function theorem to smooth maps, Sard's theorem, transversality, intersection theory, degrees of maps, vector fields and differential forms on manifolds, integration on manifolds. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513) and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall Odd Years)

MATH 5733. Differential Topology II. 3 Hours.

The continuation of Differential Topology I, with additional advanced topics. Possible advanced topics may include: Morse theory, de Rham cohomology theory, Poincare duality, Riemannian geometry, and Lie groups and Lie algebras. Prerequisite: MATH 5723 and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring Even Years)

MATH 5803. Introduction to Point-Set Topology. 3 Hours.

(Formerly MATH 4703.) A study of topological spaces including continuous transformations, connectedness and compactness. Graduate degree credit will not be given for both MATH 4703 and MATH 5803. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513). (Typically offered: Irregular)

MATH 599V. Research Topics in Mathematics. 1-3 Hour.

(Formerly MATH 499V.) Current research interests in mathematics. Graduate degree credit will not be given for both MATH 499V and MATH 599V. Prerequisite: Departmental consent. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

MATH 609V. Topics in Math Education. 1-6 Hour.

Topics in mathematics education research including curriculum, teacher education, learning theory, and assessment. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 12 hours of degree credit.

MATH 610V. Directed Readings. 1-6 Hour.

Directed readings. Prerequisite: Departmental consent. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

MATH 619V. Topics in Algebra. 1-6 Hour.

Current research interests in algebra. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MATH 6203. Theory of Probability. 3 Hours.

A rigorous mathematical treatment based on measure theory of the fundamental notions and results of the theory of probability. Topics covered include laws of large numbers, central limit theorems, conditional expectations. Additional topics that may be covered include martingales, Markov chains, Brownian motion and stochastic integration. Prerequisite: MATH 5513. (Typically offered: Fall)

MATH 6213. Mathematical Statistics. 3 Hours.

A rigorous mathematical treatment of the fundamental principles and results in the theory of Statistics. Topics include exponential families of distributions, estimation of unknown parameters, the classical theory of theory of hypothesis testing, Large sample approximations, large sample properties of estimators. Prerequisite: MATH 6203. (Typically offered: Spring)

MATH 659V. Topics in Analysis. 1-6 Hour.

Current research interests in analysis. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MATH 679V. Topics in Topology. 1-6 Hour.

Current research interest in topology. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MATH 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Doctoral candidacy in mathematics. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Mechanical Engineering (MEEG)

Darin Nutter
Department Head
204 Mechanical Engineering Building
479-575-4153
Email: dnutter@uark.edu

Steve Tung
Graduate Coordinator
204 Mechanical Engineering Building
479-575-4153
Email: chstung@uark.edu

Department of Mechanical Engineering website (<http://mechanical-engineering.uark.edu/>)

Degrees Conferred:

M.S.M.E. (MEEG)

Ph.D. in Engineering (MEEG) (See Engineering (p. 127))

Areas of Study: Thermal systems, mechanical design, nano/mesoscale materials science, and engineering mechanics.

Primary Areas of Faculty Research: Micro Electromechanical Systems (MEMS); Micro and Nano Systems; Structural Dynamics and Modal Analysis; Industrial and Commercial Energy Systems and Energy Conservation; Machining, Advanced Tooling and Coatings; Thermal and Mechanical Design of Electronic Packages; Material Failure Analysis and Design of Experiments; Unsteady Aerodynamics; Computational Materials Science; Tribology; Design Theory, Complex System Design and Analysis; Cyberphysical System Fault Modeling and Simulation; Energy Storage; Control Systems; Robotics; Additive Manufacturing.

M.S.M.E. in Mechanical Engineering

Program Goals and Student Learning Objectives for the Master of Science Degree: The program goals are broad general statements of what the Mechanical Engineering Graduate Program intends to accomplish and describes what a student will be able to do after completing the degree requirements. They prepare students:

- For independent studies in mechanical engineering.
- To contribute new knowledge of fundamental or applied importance.
- To disseminate new knowledge of fundamental or applied importance.

Student Learning Outcomes are defined in terms of the knowledge, skills, and abilities that students will know and be able to do as a result of completing a program. These student learning outcomes are directly linked to the accomplishment of the program goals listed above. They are:

1. Students will gain advanced knowledge in mechanical engineering.
2. Thesis: Students will gain a necessary understanding of their research field; non-thesis: Students will apply advanced coursework to an engineering problem.
3. Thesis: Students will contribute new knowledge of fundamental or applied importance; non-thesis: Students will demonstrate important application(s) of existing knowledge.
4. Students will be able to communicate effectively during oral presentations.
5. Students will be able to communicate effectively in writing.

Requirements for the Master of Science Degree: In addition to the requirements of the Graduate School and the graduate engineering faculty, the following departmental requirements must be satisfied by candidates for the M.S.M.E. degree.

1. Candidates who present a thesis are required to complete a minimum of 24 semester hours of course work and six semester hours of thesis.
2. Candidates who do not present a thesis are required to complete a minimum of 33 semester hours of course work, which is to include at least three hours of credit for Research or Special Problems (including a formal engineering report), completed under direction of the candidate's major adviser.
3. All students must present a grade-point average of 3.00 or better on all courses included in their plan of study, with no more than 6 hours of "C."

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Mechanical Engineering

Requirements for the Doctor of Philosophy Degree (Engineering): Students desiring to pursue a doctoral degree in engineering under the

direction of a professor in the Department of Mechanical Engineering must obtain a set of guidelines from the Graduate Coordinator.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Chen, Yue, Ph.D. (Vanderbilt University), M.S. (Hong Kong Polytechnic University), B.S. (Hunan University), Assistant Professor, 2017.

Couvillion, Rick J., Ph.D., M.S.M.E. (Georgia Institute of Technology), B.S.M.E. (University of Arkansas), Associate Professor, 1981.

Davis, James Allen, Ph.D., M.S.M.E., B.S.M.E. (University of Arkansas), Teaching Assistant Professor, 1997.

Hamilton, John H., M.S., B.S. (University of Arkansas), Instructor, 2002.

Hu, Han, Ph.D. (Drexel University), Assistant Professor, 2019.

Huang, Po-Hao Adam, Ph.D., M.S., B.S. (University of California-Los Angeles), Associate Professor, 2006.

Huitink, David, Ph.D., M.S.M.E., B.S.M.E. (Texas A&M University), Assistant Professor, 2016.

Jensen, David C., Ph.D., M.S., B.S. (Oregon State University), Associate Professor, 2012.

Leylek, Jim, Ph.D. (University of Illinois-Urbana-Champaign), M.S., B.S. (University of Illinois at Chicago), Professor, 2011.

Meng, Xiangbo, Ph.D. (University of Western Ontario), M.S.E.E. (China University of Petroleum), B.S.C.E. (Northwestern University), Assistant Professor, 2016.

Millett, Paul, Ph.D., M.S. (University of Arkansas), B.E. (Vanderbilt University), Associate Professor, 2013.

Nair, Arun, Ph.D. (Virginia Polytechnic State University), M.S. (Colorado State University), B.T. (Mahatma Gandhi University), Associate Professor, 2013.

Nutter, Darin W., Ph.D. (Texas A&M University), M.S.M.E., B.S.M.E. (Oklahoma State University), Professor, 1994.

Roe, Larry, Ph.D. (University of Florida), M.S., B.S.M.E. (University of Mississippi), Associate Professor, 1994.

Saxena, Ashok, Ph.D., M.S. (University of Cincinnati), B.S.M.E. (Indiana Institute of Technology), Distinguished Professor, 2003.

Sha, Zhenghui, Ph.D. (Purdue University), M.S.M.E. (Xi'an Jiaotong University), B.S.M.E. (Xi'an University of Technology), Assistant Professor, 2017.

Tung, Steve, Ph.D., M.S.M.E. (University of Houston), B.S.M.E. (National Taiwan University), Professor, 2000.

Wejinya, Uchechukwu C., Ph.D., M.S., B.S. (Michigan State University), Associate Professor, 2008.

Zhou, Wenchao, Ph.D. (Georgia Institute of Technology), M.S.M.E. (Xi'an Jiaotong University, Xi'an, China), B.S.M.E. (Huazhong University of Science and Technology, Wuhan, China), Assistant Professor, 2014.

Zou, Min, Ph.D., M.S.M.E. (Georgia Institute of Technology), M.S.A.E., B.S.A.E. (Northwestern Polytechnical University), Professor, 2003.

Courses

MEEG 5033. Advanced Mechanics of Materials I. 3 Hours.

Combined stress, theories of failure, thick-walled cylinders, bending of unsymmetrical sections, torsion in noncircular section, plate stresses, and strain energy analysis. Prerequisite: MEEG 2013 and MEEG 3013. (Typically offered: Irregular)

MEEG 5153. Fundamentals of Mechanical Design. 3 Hours.

(Formerly MEEG 4153.) This class is designed to provide engineering students with a head start in industry as design engineers or working in an engineering related function. The course contents cover machine design and analysis experiences as related to working in industry and performing consulting work. Major topics include the design process, design procedures, fasteners, general design and numerous consulting experiences. A concept design exercise and two special design projects will be assigned to the students as homework. Graduate degree credit will not be given for both MEEG 4153 and MEEG 5153. Prerequisite: MEEG 4103. (Typically offered: Fall)

MEEG 5163. Advanced Product Design. 3 Hours.

This course provides an in-depth and comparative study on the theories of engineering design and equips students to understand and utilize the tools and methodologies founded on those theories. (Typically offered: Fall)

MEEG 5173. Model-Based Systems Design and Analysis. 3 Hours.

This course provides students with an introduction into the two main approaches to understanding and designing complex engineered systems. First, the course covers the unique technical challenge of systems engineering and design of systems. Second, the course covers concepts, methods and tools related to 'model-based systems design.' This covers formal modeling of the information content of complex systems. The third portion of the course will focus on modeling the complex behavior of the systems. This is often described as dynamical systems modeling. Students will utilize the methods and tools presented in class to model a complex engineered system of their choice (with instructor approval). The classes will alternate between presenting modeling methods to the students and students demonstrating their system to the class utilizing those methods. Students may not receive credit for both MEEG 4173 and MEEG 5173. Prerequisite: MEEG 4103 or Instructor consent. (Typically offered: Spring Even Years)

MEEG 5203. Robot Modeling and Simulation. 3 Hours.

This is a graduate level course in Robotics dealing with the behavioral study of robots. Topics covered in this course will include but not limited to the following: mathematical modeling of robots, rigid motions and homogeneous transformation, forward/inverse kinematics of robots, velocity kinematics, path and trajectory planning, robot dynamics, joint control, PD/PID control, and multivariable control. Advanced topics may include passivity-based motion control, geometric nonlinear control, computer vision, vision-based control, and sensor fusion. Prerequisite: Graduate standing in MEEG or ELEG and consent of the instructor. (Typically offered: Spring)

MEEG 5253. Bio-Mems. 3 Hours.

Topics include the fundamental principles of microfluidics, Navier-Stokes Equation, bio/abio interfacing technology, bio/abio hybrid integration of microfabrication technology, and various biomedical and biological problems that can be addressed with microfabrication technology and the engineering challenges associated with it. Lecture 3 hours per week. Prerequisite: MEEG 3503 or CVEG 3213 or CHEG 2133. (Typically offered: Spring)
This course is cross-listed with BENG 5253.

MEEG 5263. Introduction to Micro Electro Mechanical Systems. 3 Hours.

A study of mechanics and devices on the micro scale. Course topics will include: introduction to micro scales, fundamentals of microfabrication, surface and bulk micromachining, device packaging, device reliability, examples of micro sensors and actuators. Recitation three hours per week. (Typically offered: Fall)

MEEG 5283. Microelectronics Reliability. 3 Hours.

In this course, students will learn about common failure modes experienced in electronic packaging and devices, with special attention on mechanical and thermally driven failure mechanisms. Additionally, students will gain familiarity with accelerated testing methods and the associated governing standards associated with electronics reliability qualifications used in identifying and certifying electronics for various applications. Prerequisite: ELEG 5273 or instructor consent. (Typically offered: Fall Even Years)

MEEG 5303. Physical Metallurgy. 3 Hours.

Physical and chemical properties of solids and the application of materials in commerce. Prerequisite: MEEG 2303. (Typically offered: Irregular)

MEEG 5333. Introduction to Tribology. 3 Hours.

A study of science and technology of interacting surfaces in relative motion. Topics include solid surface characterization, contact between solid surfaces, adhesion, friction, wear, lubrication, micro/nanotribology, friction and wear screening test methods, and tribological components and applications. Students may not earn credit for both MEEG 5333 and MEEG 4313. Prerequisite: Graduate standing. (Typically offered: Irregular)

MEEG 5343. Computational Material Science. 3 Hours.

This course provides students with an overview of different modeling techniques in material science. Applications will be presented on a broad range of modeling techniques including atomistic simulation methods, Monte Carlo techniques, molecular mechanics, and molecular dynamics. Prerequisite: Graduate standing. (Typically offered: Irregular)

MEEG 5353. Lithium-ion Batteries and Beyond: Materials, Characterization, and Performance. 3 Hours.

This course is intended to provide students an overview of various battery systems and help students establish the concepts of primary and secondary batteries. The course materials will focus on lithium-ion batteries (LIBs), covering their electrochemical mechanisms, components, materials synthesis, materials characterization, and performance evaluations. Prerequisite: CHEM 1103 and MEEG 2303. (Typically offered: Fall)

MEEG 5403. Advanced Thermodynamics. 3 Hours.

An in-depth review of classical thermodynamics, including availability analysis, combustion, and equilibrium, with an introduction to quantum mechanics and statistical thermodynamics. Prerequisite: Graduate standing in Engineering or consent of instructor. (Typically offered: Spring)

MEEG 5453. Advanced Heat Transfer. 3 Hours.

More in-depth study of topics covered in MEEG 4413, Heat Transfer, and coverage of some additional topics. Prerequisite: MEEG 4413 or equivalent. (Typically offered: Fall)

MEEG 5473. Radiation Heat Transfer. 3 Hours.

Spectral analysis, radiant exchange in gray and non-gray enclosures, gas radiation, and multi-mode heat transfer. Prerequisite: MEEG 5453 or equivalent. (Typically offered: Summer Even Years)

MEEG 5483. Thermal Systems Analysis and Design. 3 Hours.

(Formerly MEEG 4483.) Analysis design and optimization of thermal systems and components with examples from such areas as power generation, refrigeration, and propulsion, Availability loss characteristics of energy systems and availability conservation methods. Graduate degree credit will not be given for both MEEG 4483 and MEEG 5483. Prerequisite: MEEG 4413. (Typically offered: Fall and Summer)

MEEG 5503. Advanced Fluid Dynamics I. 3 Hours.

A basic survey of the characteristics of fluid flow under a variety of conditions with examples. Begins with a derivation of the Navier-Stokes equations and an evaluation of the dimensionless groups found from these equations. Topics to be covered include viscous laminar and turbulent boundary layers, jets and wakes, Stokes flow, inviscid flows with and without free surfaces and turbulence. Prerequisite: MEEG 3503 and MATH 2584. (Typically offered: Spring)

MEEG 5513. Introduction to Flight. 3 Hours.

(Formerly MEEG 4503.) The course will provide understanding in basic aerodynamics, airfoil design and characteristics, and flight control surfaces. Graduate degree credit will not be given for both MEEG 4503 and MEEG 5513. Prerequisite: MATH 2584, MEEG 3503. (Typically offered: Fall)

MEEG 5523. Astronautics. 3 Hours.

(Formerly MEEG 4523.) Study of spacecraft design and operations. Graduate degree credit will not be given for both MEEG 4523 and MEEG 5523. Prerequisite: MEEG 2013 and MEEG 2403 or consent of instructor. (Typically offered: Irregular)

MEEG 5533. Fundamentals of Aerodynamics. 3 Hours.

A study of external-flow fluid mechanics applied to Aerodynamics. Topics include integral and differential forms of the basic fluid equations (continuity, momentum, and energy), potential flow, and supersonic flow. Prerequisite: MEEG 3503. (Typically offered: Spring)

MEEG 5633. Additive Manufacturing. 3 Hours.

This course provides an overview of developing opportunities and critical challenges of additive manufacturing (AM, also known as 3-D printing). It covers existing and emerging additive manufacturing processes in the context of product design, materials selection and processing, and industrial and consumer applications. Students may not receive credit for both MEEG 4633 and MEEG 5633. Prerequisite: MEEG 2101, MEEG 2303, MEEG 3013, and MEEG 3503 or instructor consent. (Typically offered: Spring)

MEEG 5733. Advanced Numerical Methods. 3 Hours.

Numerical methods for the solution of linear and non-linear ordinary and partial differential equations; initial and boundary value problems; one-step and multi-step methods; predominantly finite difference but also finite element and control volume techniques; and computer applications. Graduate standing in Engineering or consent of instructor. (Typically offered: Irregular)

MEEG 5833. Aerospace Propulsion. 3 Hours.

(Formerly MEEG 4433.) Principles, operation, and characteristics of gas turbine and rocket engines. Brief study of novel spacecraft propulsion systems. Graduate degree credit will not be given for both MEEG 4433 and MEEG 5833. Prerequisite: MEEG 3503. (Typically offered: Irregular)

MEEG 5853. Industrial Waste and Energy Management. 3 Hours.

(Formerly MEEG 4453.) Applications of thermodynamics, heat transfer, fluid mechanics, and electric machinery to the analysis of waste streams and energy consumption for industrial facilities. Current techniques and technologies for waste minimization and energy conservation including energy-consuming systems and processes, utility rate analysis, economic analysis and auditing are taught. Graduate degree credit will not be given for both MEEG 4453 and MEEG 5853. Prerequisite: MEEG 4413. (Typically offered: Irregular)

MEEG 5873. Indoor Environmental Control. 3 Hours.

(Formerly MEEG 4473.) Gives student a thorough understanding of the fundamental theory of air conditioning design for commercial buildings, including calculating heating and cooling loads along with the proper selection and sizing of air conditioning equipment. Graduate degree credit will not be given for both MEEG 4473 and MEEG 5873. Prerequisite: MEEG 4413. (Typically offered: Irregular)

MEEG 591V. Special Topics in Mechanical Engineering. 1-6 Hour.

Consideration of current advanced mechanical engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MEEG 592V. Individual Study in Mechanical Engineering. 1-6 Hour.

Opportunity for individual study of advanced subjects related to a graduate mechanical engineering program to suit individual requirements. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MEEG 5953. Fundamentals of Fracture and Fatigue in Structures. 3 Hours.

The course will cover the concepts of linear-elastic, elastic-plastic and time-dependent Fracture Mechanics as applied to fracture in a variety of materials, structures, and operating conditions. The examples will include fracture in large components such as aircraft, bridges and pressure vessels and also in bones and in soft materials and human tissue. Prerequisite: Graduate standing in Civil, Mechanical or Biomedical Engineering or consent of the instructor. (Typically offered: Fall and Spring)

This course is cross-listed with BMEG 5953, CVEG 5953.

MEEG 5963. Advanced Fracture Mechanics and Structural Integrity. 3 Hours.

This course provides an in-depth treatment of advanced topics in fracture mechanics such as stress analysis of cracks under elastic-plastic loading, crack initiation and growth under elastic-plastic and time-dependent creep and creep-fatigue conditions. The course emphasizes fundamental underpinnings of nonlinear fracture mechanics and its use in material evaluation and life prediction methodology for structural components. Micro-mechanics of fracture and crack growth processes are also covered. Prerequisite: MEEG 5953, or BMEG 5953, or CVEG 5953 or equivalent, or instructor consent. (Typically offered: Fall and Spring)

MEEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MEEG 6800. Graduate Seminar. 0 Hours.

A periodic seminar devoted to mechanical engineering research topics. Course includes letter grades A, B, C, D, and F as well as CR. (Typically offered: Fall and Spring)

MEEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Modern Languages (MLAN)

Steven Bell

Chair of Department of World Languages, Literatures and Cultures

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479-575-2951

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Nancy Arenberg

Graduate Coordinator of French

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Brett Sterling

Graduate Coordinator of German

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479-575-2951

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World Languages, Literatures and Cultures Website (<https://fulbright.uark.edu/departments/world-languages/>)

Degree Conferred:

M.A. (MLAN)

Areas of Concentration: French and German. Supporting courses are offered in Greek and Latin.

Primary Areas of Faculty Research: Please refer to the Department of World Languages, Literatures and Cultures website for detailed information on faculty members and their areas of expertise.

Degree Program: The Master of Arts Degree in Modern Languages is offered in two tracks, German and French.

M.A. in Modern Languages with French Track

Prerequisites to Degree Program: The student must have a B.A. degree or equivalent from an accredited institution with suitable preparation in the chosen foreign language and be accepted by the department. Deficiencies in undergraduate major or prerequisites for advanced courses may be included in the student's program.

French Concentration

The Master of Arts degree in Modern Languages, French Concentration offers course work related to the literary and cultural histories of the greater Francophone world, focusing on France. The program provides advanced preparation in literary analysis and research and offers training for teaching French at the college level, including the most recent technological techniques in teaching foreign languages. Graduates of the program receive a solid preparation to pursue a Ph.D. or to teach at the college or secondary levels. Our comprehensive curriculum enables students to pursue careers in education, government, international organizations and other business opportunities either abroad or within the United States. In conjunction with the Comparative Literature and Cultural Studies program (CLCS), the program contributes to the master's and Ph.D. programs for students working in either Francophone literature, translation, French literature or French cultural studies.

Requirements for the Master of Arts Degree in Modern Languages,

French Concentration: Aside from deficiencies, a minimum of 36 semester hours is required for the degree; six of the hours must be selected from the following courses: WLLC 5023, WLLC 5033, WLLC 5063 or other approved WLLC courses. Each M.A. candidate will submit a list of their course work to the graduate adviser before taking the comprehensive exam, which is comprised of a written and an oral exam. The content of the M.A. exam covers course work and the reading list. All course selections must be approved by the graduate adviser.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.S. in Modern Languages with German Track

Prerequisites to Degree Program: The student must have a B.A. degree or equivalent from an accredited institution with suitable preparation in the chosen foreign language and be accepted by the department. Deficiencies in undergraduate major or prerequisites for advanced courses may be included in the student's program. The Master of Arts Degree in Modern Languages is offered in two concentrations, German and French.

German Concentration

The Master of Arts Degree in Modern Languages, German Concentration offers course work related to the greater German-speaking world, including Germany, Austria, and Switzerland. The program offers a traditional, canon-centered degree in literary history. Students concentrate primarily on courses investigating literary epochs and particular genres that are focused on literary analysis and research.

Graduates of the program generally continue study at the doctoral level at other institutions or complete alternative licensure or the M.A.T. to teach at the secondary level. Doctoral training in cultural studies and translation

is also offered in conjunction with the Comparative Literature and Cultural Studies Program.

Requirements for the Master of Arts Degree Modern Languages, German Concentration: Aside from deficiencies, a minimum of 36 semester hours of course work is required for the degree, six hours of which must be selected from the following courses: WLLC 5023, WLLC 5033, or WLLC 5063. Each candidate must pass a comprehensive examination covering course work and a reading list. Upon admission to this program the candidate will be assigned an adviser who, in consultation with the candidate, will design a suitable program for the candidate. The adviser, in consultation with other members of the department, will select an examination committee for the comprehensive written and oral examinations. Detailed program descriptions, including reading lists and examination procedures, are available from the department.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Music (MUSC)

Ronda Mains
Department Chair
201 Music Building
479-575-4701
Email: rmains@uark.edu

Chris MacRae
Director of Graduate Studies
309 Music Building
479-575-4534
Email: macrae@uark.edu

Department of Music Website (<http://www.uark.edu/depts/uamusic/>)

Degree Conferred:
M.M. (MUSC)

Graduate Certificates Offered:
Advanced Performance (non-degree)
Music Education for Special Needs Students (non-degree)

Areas of Concentration for the M.M. in Music: Applied music, composition, theory, instrumental and choral conducting, music history, and music education.

M.M. with Performance, Instrumental Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.

2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

A. Master of Music in Performance, Instrumental

I. Applied Music

Required Courses		
MUAP 510V	Applied Voice/Instrument	14
MUAP 5201	Graduate Recital I	1
MUAP 5211	Graduate Recital II	1

II. Music History, Ethnomusicology, and Music Theory

MUHS 5973	Seminar in Bibliography and Methods of Research	3
MUHS 5903	Seminar in Musicology	3
Select one of the following:		3

MUTH 577V	Special Topics in Music Theory	
MUTH 5623	Pedagogy of Theory	
MUTH 5343	Analytical Techniques	
MUTH 5643	Analysis of 20th Century Music	

Select one of the following:		3
Music History, Ethnomusicology, and/or Music Theory to be selected from above, or:		

MUHS 5253	Special Topics in Music History	
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III. Electives

To be selected from music courses at the 4000-6000 level with the consent of the adviser and to include not more than 4 hours of ensemble.	8
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Note: Study of the appropriate literature is required if not adequately covered in the undergraduate degree presented for admission but will count toward the degree as an elective.

Total Hours	36
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M.M. with Performance, Keyboard Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

B. Master of Music in Performance, Keyboard:

I. Applied Music

MUAP 510V	Applied Voice/Instrument	14
MUAP 5201	Graduate Recital I	1
MUAP 5211	Graduate Recital II	1

II. Music History, Ethnomusicology, and Music Theory

MUHS 5973	Seminar in Bibliography and Methods of Research	3
Three or more hours of 5000-level MUHS or MUSY courses selected in consultation with the student's major adviser		3
Select one of the following:		3

MUTH 577V	Special Topics in Music Theory
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MUTH 5623	Pedagogy of Theory
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MUTH 5343	Analytical Techniques
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MUTH 5643	Analysis of 20th Century Music
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Select one of the following:		3
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Music History, Ethnomusicology, and/or Music Theory to be selected from above.	
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MUHS 5253	Special Topics in Music History
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III. Electives

To be selected from music courses at the 4000-6000 level with the consent of the adviser and to include not more than 4 hours of ensemble.		8
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Note: Study of keyboard literature is required if not adequately covered in the undergraduate degree presented for admission but will count toward the degree as an elective.

Total Hours	36
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M.M. with Performance, Voice Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.

- All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
- Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

C. Master of Music in Performance, Voice:

I. Applied Music Requirements include:

MUAP 510V	Applied Voice/Instrument (total 14 hours, to include:)	14
	a) Preparation of one complete operatic or oratorio role	
	b) Demonstration of language proficiency in English and three foreign languages	

Note: Foreign language proficiency may be demonstrated by the undergraduate transcript, undergraduate classes taken at the University of Arkansas, or by examination by the Department of World Languages, Literatures, and Cultures. Minimum requirements include two semesters of Italian, two semesters of French or German, and one semester of the remaining language.

MUAP 5201	Graduate Recital I	1
MUAP 5211	Graduate Recital II	1
MUEN 5401	Opera Theatre (two semesters)	2

II. Music History, Ethnomusicology, and Music Theory

MUHS 5973	Seminar in Bibliography and Methods of Research	3
	Three or more hours of 5000-level MUHS or MUSY courses selected in consultation with the student's major adviser	3
	Select one of the following:	3
MUTH 577V	Special Topics in Music Theory	
MUTH 5623	Pedagogy of Theory	
MUTH 5343	Analytical Techniques	
MUTH 5643	Analysis of 20th Century Music	

Electives totaling 3 hours in either music history, ethnomusicology, and/or music theory to be selected from (2) or (3e) above of MUHS 4253 or MUHS 4963H

III. ELECTIVES

To be selected from music courses at the 4000-6000 level with the consent of the adviser and to include not more than 4 hours of ensemble

Note: Study of vocal literature is required if not adequately covered in the undergraduate degree presented for admission but will count toward the degree as an elective.

Total Hours		36
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M.M. with Collaborative Piano Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

- Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
- Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
- Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
- Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

- All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
- Candidates needing to augment their piano skills will be required to take additional piano study.
- Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
- All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
- Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

D. Master of Music in Collaborative Piano :

I. APPLIED MUSIC (16 hours)

MUAP 510V	Applied Voice/Instrument (Note: MUAP is taken every semester for four semesters)	14
MUAP 5201	Graduate Recital I	1
MUAP 5211	Graduate Recital II	1

II. MUSIC THEORY, MUSIC HISTORY AND MUSIC LITERATURE (15 hours):

MUHS 5973	Seminar in Bibliography and Methods of Research	3
	One 5000-level MUHS course	3
	One music theory class to be selected from the following:	3
MUTH 577V	Special Topics in Music Theory	
MUTH 5343	Analytical Techniques	
MUTH 5623	Pedagogy of Theory	
MUTH 5643	Analysis of 20th Century Music	
MUHS 5563	Collaborative Piano Literature I, Woodwind and Brass Repertoire	3
MUHS 5573	Collaborative Piano Literature II, String Repertoire	3

III. ELECTIVES (5 hours)

To be selected from the following courses with the consent of the adviser: 5

MUHS 5763	Survey of Vocal Literature I
MUHS 5673	Survey of Vocal Literature II
MUTH 5322	Score Reading
MUPD 582V	Conducting
MUHS 5633	Survey of Symphonic Literature

M.M. with Composition Concentration**Prerequisites for applying to the Master of Music Degree Program:**

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

E. Master of Music in Composition:**I. Music Theory and Composition**

MUTH 5643	Analysis of 20th Century Music	3
	or MUTH 5343 Analytical Techniques	
MUTH 568V	Composition (must be repeated for 6 hours)	6
MUTH 600V	Master's Thesis	6
	Electives in Music Theory	6

II. Music History, Ethnomusicology, and Literature

MUHS 5973	Seminar in Bibliography and Methods of Research	3
	Three or more hours of 5000-level MUHS or MUSY courses selected in consultation with the student's major adviser	3

III. Electives

	Graduate-level courses to be selected from MUAP, MUEN (4 credit maximum), MUHS, MUSY, MUTH, or MUPD areas or other disciplines with consent of the major adviser.	9
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Total Hours		36
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M.M. with Music Education Concentration**Prerequisites for applying to the Master of Music Degree Program:**

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the

foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

J. Master of Music in Music Education

I. Music Core

MUTH 5623	Pedagogy of Theory	3
Select one of the following:		3-4
MUHS 5693	Band Literature	
MUHS 5952 & MUHS 5962	Choral History and Literature I and Choral History and Literature II	
MUHS 5633	Survey of Symphonic Literature	
MUAP 500V & MUAP 510V	Applied Voice/Instrument-Secondary Level and Applied Voice/Instrument	2

II. Music Education Core

MUED 5513	Seminar: Resources in Music Education	3
MUED 5811	Curriculum Design in Music	1
MUED 5653	Seminar: Issues in Music Education	3
MUED 5733	Music Education in the Elementary School	3
MUED 5973	Tests and Measurement in Music	3
MUED 5983	Psychology of Music Behavior	3
Select one of the following:		3-6

III. MUED 600V Master's Thesis

MUED 600V Master's Thesis

A research thesis in the field of music education. The thesis at the master's level may be preparatory or exploratory for a dissertation to be developed later in connection with work toward a doctorate.

IV. MUED 605V

MUED 605V Independent Study

Select one of the following:

- 1) One (or more) original compositions
- 2) An arrangement of an existing large musical work for band, orchestra, chorus, or other ensemble.
- 3) Lecture-Recital
- 4) Development of an instructional method or innovative curriculum design.
- 5) A project involving educational planning, e.g., an administrative problem or a teaching or resource unit

V. Electives

Courses to be chosen with the consent of the advisory committee, to include some work in one of the following areas of specialization: Elementary, Secondary Choral, or Secondary Instrumental. A maximum of two hours of ensembles may count as electives.

Total Hours 32-40

M.M. with Music History Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

G. Master of Music in Music History

I. Music History and Literature

MUHS 5973	Seminar in Bibliography and Methods of Research	3
MUHS 5903	Seminar in Musicology (Select a different topic each semester for three semesters.)	9

Select one of the following: 2-3

MUHS 5722	Directed Studies in Music Literature I	
MUHS 5732	Directed Studies in Music Literature II	
MUHS 5952	Choral History and Literature I	
MUHS 5253	Special Topics in Music History	
MUHS 600V	Master's Thesis	6

II. Applied Music

MUAP 500V	Applied Voice/Instrument-Secondary Level	4
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III. Music Theory

Six hours to be selected from the following: 6

MUTH 577V	Special Topics in Music Theory	
MUTH 5343	Analytical Techniques	

MUTH 5623	Pedagogy of Theory	
MUTH 5643	Analysis of 20th Century Music	
IV. Electives		
Courses either within the music department or in related fields, subject to the approval of the major adviser. Five-six credit hours as needed to total 36 hours for the degree.	5-6	
Total Hours		36

M.M. with Music Theory Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

F. Master of Music in Music Theory:

I. Music Theory and Composition

MUTH 5623	Pedagogy of Theory	3
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MUTH 5643	Analysis of 20th Century Music or MUTH 5343 Analytical Techniques	3
MUTH 600V	Master's Thesis	6
Courses to be selected from MUTH courses at the 4000- or 5000-level (9 hours minimum).		9

II. Music History, Ethnomusicology, and Literature

MUHS 5973	Seminar in Bibliography and Methods of Research	3
Three or more hours of 5000-level MUHS or MUSY courses selected in consultation with the student's major adviser		3

III. Electives

Graduate-level courses to be selected from MUAP, MUEN (4 credit maximum), MUHS, MUSY, MUTH, or MUPD areas or other disciplines with consent of the major adviser.		9
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Total Hours		36
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M.M. with Instrumental Conducting Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the

foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

H. Master of Music in Instrumental Conducting

I. Music Theory

MUTH 5612	Orchestration	2
or MUTH 5672	Advanced Orchestration	
MUTH 5322	Score Reading	2
Select one of the following:		3
MUTH 577V	Special Topics in Music Theory	
or MUTH 5349	Analytical Techniques	
or MUTH 5649	Analysis of 20th Century Music	

II. Music History and Literature

MUHS 5693	Band Literature	3
MUHS 5903	Seminar in Musicology	3
MUHS 5973	Seminar in Bibliography and Methods of Research	3
Select one of the following:		2-3
MUHS 5253	Special Topics in Music History	
MUHS 5952	Choral History and Literature I	
MUHS 5962	Choral History and Literature II	

III. Applied Music

MUAP 500V	Applied Voice/Instrument-Secondary Level (woodwind, brass, or percu)	4
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IV. Conducting

MUPD 582V	Conducting (four semesters, two hours per semester)	8
MUAP 5201 & MUAP 5211	Graduate Recital I and Graduate Recital II	2

V. Electives

Total Hours		36-37
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M.M. with Choral Conducting Concentration

Prerequisites for applying to the Master of Music Degree Program:

Applicants should possess a bachelor's degree with a major in music from an accredited institution. The applicant must apply to both the Graduate School and the Department of Music. In addition, applicants should schedule an audition/interview with the appropriate music faculty.

The specific requirements for admission to each individual concentration of the Master of Music degree program are:

1. Performance and Collaborative Piano applicants must audition for, or submit a DVD of a recorded performance to the appropriate graduate faculty.
2. Music Education applicants are expected to have prior teaching experience and submit a DVD of a recent classroom teaching experience.
3. Music History and Music Theory applicants should submit a paper representative of their work as well as scores for the Graduate Record Exam.
4. Composition applicants are required to submit three of their compositions.

Requirements for the Master of Music Degree: In addition to the general requirements of the Graduate School the following must be met:

1. All candidates pursuing the degree of Master of Music with concentrations in Collaborative Piano, Composition, Conducting, Music History, Music Theory, and Performance are required to take a diagnostic exam for aural theory, written theory, and music history prior to the beginning of their first semester of study. Any student diagnosed with deficiencies will be required to register for remedial courses.
2. Candidates needing to augment their piano skills will be required to take additional piano study.
3. Candidates are required to take comprehensive written examinations followed by an oral examination after the completion of coursework.
4. All candidates must participate in at least one ensemble per semester throughout their residence unless pursuing a concentration in Composition, Music Theory, Music History, or Music Education.
5. Candidates for the Master of Music with Music History Concentration are expected to have or acquire reading and writing proficiency in the foreign language corresponding to their field of research (preferably German, Italian, or French).

The programs of study are listed below. All course selections are subject to approval of the graduate adviser in consultation with applied teacher or thesis director.

I. Master of Music in Choral Conducting

I. Music Theory

MUTH 5322	Score Reading	2
Select one of the following:		3
MUTH 577V	Special Topics in Music Theory	
or MUTH 5349	Analytical Techniques	
or MUTH 5649	Analysis of 20th Century Music	

II. Music History and Literature

MUHS 5903	Seminar in Musicology	3
MUHS 5973	Seminar in Bibliography and Methods of Research	3
MUHS 5952	Choral History and Literature I	2
MUHS 5962	Choral History and Literature II	2

III. Applied Music

MUAP 500V	Applied Voice/Instrument-Secondary Level (two semesters of voice and two semesters of piano or organ)	4
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IV. Conducting

MUPD 582V	Conducting (four semesters, two hours per semester)	8
MUAP 5201	Graduate Recital I	1
MUAP 5211	Graduate Recital II	1

V. Ensemble

MUEN 5451	Schola Cantorum	4
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VI. Electives

Total Hours		36
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Graduate Certificate in Advanced Performance

The Graduate Certificate in Advanced Performance is a performance-intensive program for students who already possess the Master of Music or its equivalent. It is designed for all areas of applied study, and is

intended for the advanced performer. (Note: The graduate certificate is not a degree.)

Prerequisites to the Graduate Certificate: To enter this program, students must be admitted by the Graduate School and should consult with the Director of Graduate Studies in Music for the specific area of study in which they are interested. The Department Chair and the Director of Graduate Studies in Music, in consultation with the faculty of the specific area, will determine acceptance, provisional acceptance contingent on the making up of specific deficiencies, or rejection of the student for admission to the program in the specific area of concentration.

Requirements for the Graduate Certificate: In addition to the general requirements of the Graduate School the following conditions must be met:

1. All students seeking admission to the program for the Graduate Certificate must show evidence of outstanding performance aptitude and proficiency and demonstrate clear potential for a career as a professional musician.
2. All applicants must present an audition with advanced repertoire encompassing four different style periods and not lasting less than 30 minutes.
3. All applicants must display proficiency in music theory and history at the Master of Music level or equivalent through transcripts or an entry examination.
4. At the end of the program the student must present a full length recital (ca. 70 min).

The programs of study are listed below. All course selections are subject to the approval of the graduate adviser in consultation with the applied teacher.

Course Requirements: 16 hours

I. Applied Music

MUAP 510V	Applied Voice/Instrument	9
MUAP 5201	Graduate Recital I	1

II. Electives 6

To be selected from music courses at the 4000-6000 level with the consent of the adviser. Possible areas of study include composition, conducting, chamber music, music theory, and music history.

Areas of applied music concentration: Piano, violin, viola, violoncello, string bass, clarinet, bassoon, flute, oboe, alto saxophone, French horn, trombone, baritone, tuba, trumpet, percussion.

Total Hours 16

Graduate Certificate in Music Education for Special Needs Students

Requirements for the Graduate Certificate in Music Education for Special Needs Students: The graduate certificate requires 15 hours of coursework in one of the following semester sequences:

One-Year Plan

Fall Semester		
MUED 5743	Characteristics of Special Needs Students in the Music Classroom	3
SPED 5733	Inclusive Practices for Diverse Populations	3
Spring Semester		
MUED 5753	Teaching Music to Students with Special Needs	3

MUED 5763	Practicum in Teaching Music to Students with Special Needs	3
SPED 5783	Professional and Family Partnerships	3
Total Hours		15

Two-Year Plan

Fall Semester 1		
MUED 5743	Characteristics of Special Needs Students in the Music Classroom	3
Spring Semester 1		
SPED 5783	Professional and Family Partnerships	3
Fall Semester 2		
SPED 5733	Inclusive Practices for Diverse Populations	3
Spring Semester 2		
MUED 5753	Teaching Music to Students with Special Needs	3
MUED 5763	Practicum in Teaching Music to Students with Special Needs	3
Total Hours		15

Graduate Faculty

- Abrahams, Daniel**, Ph.D. (Oakland University), M.M. (University of Nebraska at Omaha), B.M.E. (Temple University), Assistant Professor, 2016.
- Allen, Jeremy L.**, D.M.A. (Cleveland Institute of Music), M.M. (University of Kentucky), B.S. (John Brown University), Lecturer, 2018.
- Baranello, Micaela**, Ph.D., M.A. (Princeton University), B.A. (Swarthmore College), Assistant Professor, 2017.
- Caldwell, Stephen E.**, D.M.A. (Rutgers State University-New Brunswick), M.M. (Temple University), B.M.E. (University of Northern Colorado), Assistant Professor, 2012.
- Cholthitchanta, Nophachai**, D.M.A. (University of Missouri-Kansas City), M.M. (University of Northern Colorado), B.M. (Chulalongkorn University, Thailand), Associate Professor, 2001.
- Delaplain, Theresa R.**, D.M.A. (University of Cincinnati), M.M. (Bowling Green State University), B.M. (University of Michigan), Instructor, 1997.
- Duncan, Jamal**, D.M.A., B.M. (University of Michigan), Instructor, 2013.
- Gosman, Alan R.**, Ph.D. (Harvard University), Associate Professor, 2014.
- Hammel, Alice**, D.M.A. (Shenandoah University), M.M. (Florida State University), B.M. (Shenandoah University), Instructor, 2016.
- Herzog, Jacob**, M.M. (Manhattan School of Music), B.M. (Berklee College of Music), Instructor, 2016.
- Kahng, Er-Gene**, D.M. (Northwestern University), A.D., M.M. (Yale University), B.A. (University of California-Los Angeles), Associate Professor, 2007.
- Kashiwagi, Tomoko**, D.M.A. (University of Texas at Austin), M.M., B.M. (Indiana University), Assistant Professor, 2012.
- Kim, Hyun**, Ph.D., D.M.A. (University of Colorado), M.M. (University of Cincinnati), M.M. (Sung-Shin Women's University), B.M. (Chung-Ang University), Visiting Assistant Professor, 2018.
- Knighten, Chris**, D.M.A., M.M. (University of Colorado), B.M. (Baylor University), Associate Professor, 2009.
- Knighten, Janet Whitman**, M.M., B.M. (East Carolina University), Assistant Professor, 2009.
- Larsen, Josquin**, Diplome (Conservatoire A Rayonnemenet Regional Jean-Philippe Rameau), M.M. (Boston Conservatory), B.A. (University of Northern Colorado), Lecturer, 2018.
- Lau, Wing**, Ph.D. (University of Oregon), M.M. (Indiana University), Lecturer, 2016.

Lorenzo, Benjamin, D.M.A., M.M. (University of Texas), B.M. (Florida International University), Assistant Professor, 2015.

MacRae, Christopher J., D.M.A. (Boston University), Instructor, 2015.

Mains, Ronda M., D.M.A. (University of Oregon), M.A., B.M. (Boise State University), Professor, 1987.

Malis, David, M.M. (University of Cincinnati), Assistant Professor, 2013.

Margulis, Elizabeth Hellmuth, Ph.D., M.A., M.Phil. (Columbia University), B.M. (Peabody Conservatory), Professor, 2006.

Margulis, Jura, Graduate Performance Diploma (Peabody Conservatory of Music, Johns Hopkins University) M.M. (Musikhochschule Freiburg, Germany), B.M. (Musikhochschule Freiburg, Germany), Professor, 1999.

Mihalka, Matthew W., Ph.D. (University of Minnesota), M.A. (University of Minnesota-Duluth), M.A. (University of Minnesota-Twin Cities), Instructor, 2011.

Misenhelter, Dale D., Ph.D. (Florida State University), M.A. (University of Wyoming), B.M. (Florida State University), Professor, 2002.

Mixdorf, Cory, D.M.A., M.M. (Indiana University), B.A. (University of Northern Iowa), Assistant Professor, 2013.

Mueller, Robert K., D.M.A. (University of Cincinnati), M.M. (Bowling Green State University), B.A. (Northern Michigan University), Professor, 1988.

Murdock, Jeffrey A., Ph.D. (University of Memphis), M.M., B.M. (University of Southern Mississippi), Assistant Professor, 2015.

Na, Dominic K., D.M.A. (University of North Texas), A.D. (Southern Methodist University), Instructor, 2016.

Ortega, Catalina, M.M. (University of Arkansas), B.A. (Pontificia Universidad Javeriana, Colombia), Instructor, 2014.

Panayotova, Miroslava Saifur, Ph.D. (University of Arizona), Instructor, 2014.

Park, Joon, Ph.D. (University of Oregon), M.A., B.M. (Eastman School of Music), Assistant Professor, 2016.

Park, Moon, D.M.A. (University of Cincinnati), M.M. (Staatliche Hochschule fur Musik in Freiburg), B.M. (University of Seoul National), Assistant Professor, 2012.

Pierce, Benjamin J., D.M.A., M.M. (University of Michigan-Ann Arbor), B.M. (Bowling Green State University), Professor, 2003.

Ragsdale, Chal, M.M. (East Carolina University), B.S. (Auburn University), University Professor, 1975.

Riley, Nastassja, M.M. (Florida State University), Lecturer, 2014.

Rulli, Richard J., D.M.A. (University of Wisconsin-Madison), M.M. (Ithaca College), B.M. (University of Northern Colorado), Associate Professor, 2003.

Runkles, Henry S., M.M. (University of Arkansas), Lecturer, 2002.

Salonen, Rick, Ed.D., M.M. (University of Arkansas), B.M. (Central Michigan University), Instructor, 2008.

Teal, Kimberly Hannon, Ph.D., M.M. (Eastman School of Music), B.A. (University of Oregon), Assistant Professor, 2016.

Thompson, Timothy F., D.M.A., M.M. (University of Wisconsin-Madison), Professor, 1979.

Troiano, Eric, D.M.A., M.M. (Michigan State University), B.M. (Ithaca College), Instructor, 2016.

Uribe, Lia, D.M.A. (University of Kansas), M.M. (University of Arkansas), B.M. (Universidad Nacional de Colombia, Bogotá), Assistant Professor, 2013.

Warren, W. Dale, M.M. (University of Kentucky), B.S. (Austin Peay State University), Professor, 1991.

Applied Music (Class) Courses

MUAC 5371. Teaching the High School Percussionist. 1 Hour.

(Formerly MUAC 4371.) A study of solo literature and small and large ensemble literature appropriate for the high school percussionist. Emphasis on advanced snare drum and marimba lit., timpani and the broad range of percussionist instruments. Includes study of high school band, orchestra and percussion ensemble scores. Graduate degree credit will not be given for both MUAC 4371 and MUAC 5371. Prerequisite: MUED 1371. (Typically offered: Irregular)

MUAC 5421. Advanced Studies in Improvisation. 1 Hour.

Extends the techniques built in the improvisation course sequence (MUAC 3401, MUAC 3411, MUAC 4401, MUAC 4411) with specialized topics in a variety of improvisatory traditions. Sections may include 'Free Jazz', 'Coltrane and Chromaticism' 'Atonal Improvisation', 'Baroque Improvisation' and 'World Music Improvisation'. Prerequisite: Instructor consent. (Typically offered: Irregular) May be repeated for up to 2 hours of degree credit.

Applied Music (Private Inst) Courses

MUAP 500V. Applied Voice/Instrument-Secondary Level. 1-2 Hour.

Private study at the graduate secondary level. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUAP 510V. Applied Voice/Instrument. 1-5 Hour.

Private study at the graduate level. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUAP 5201. Graduate Recital I. 1 Hour.

Preparation and performance of a public recital of a minimum of 50 minutes of music. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUAP 5211. Graduate Recital II. 1 Hour.

Preparation and performance of a public recital of a minimum of 50 minutes of music. (Typically offered: Fall and Spring) May be repeated for degree credit.

Ethnomusicology Courses

MUSY 5113. Proseminar: Ethnomusicology. 3 Hours.

An introduction to ethnomusicological study, with readings and discussion of seminal writings in the field and practical experience in ethnomusicological analysis and description. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MUSY 5323. Seminar: Topics in Asian and Middle Eastern Poetry and Music. 3 Hours.

Reading seminars on selected topics, such as Poetry and Music in Persian, Arabic and Turkish Cultures of the Islamic World; and Poetry and Song in Early East Asia. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Music Education Courses

MUED 5513. Seminar: Resources in Music Education. 3 Hours.

Study of the analytical and writing skills necessary for academic research in music education. Each student identifies one problem specific to music education, finds and reviews related literature and sources, develops a comprehensive bibliography, and writes a paper which synthesizes the research. Open to graduate students and undergraduates in honors in music education. (Typically offered: Irregular)

MUED 5653. Seminar: Issues in Music Education. 3 Hours.

A seminar exploring the relationships between the profession of teaching music and selected views about learning theories, teaching methods, philosophy, psychology, and other selected topics relevant to contemporary music education. (Typically offered: Irregular)

MUED 5733. Music Education in the Elementary School. 3 Hours.

Concepts of elementary music education; methods, materials, curriculum design, and supervision in elementary school music. (Typically offered: Irregular)

MUED 5743. Characteristics of Special Needs Students in the Music Classroom. 3 Hours.

A review of characteristics and behaviors of students in the music classroom that have identified or unidentified disabilities in learning. Prerequisite: Admittance into Music Education for Special Needs Students Graduate Certificate. (Typically offered: Fall)

MUED 5753. Teaching Music to Students with Special Needs. 3 Hours.

Instructs students how to construct and implement curriculum and assessments for students with special needs in a music classroom. Prerequisite: MUED 5743. (Typically offered: Spring)

MUED 5763. Practicum in Teaching Music to Students with Special Needs. 3 Hours.

Students will utilize and evaluate designed curriculum and assessment from MUED 5753 in a music classroom. Prerequisite: MUED 5743. Corequisite: MUED 5753. (Typically offered: Spring)

MUED 577V. Special Topics in Music Education. 1-4 Hour.

(Formerly MUED 477V.) Subject matter not covered in other sources. With permission, may be repeated for credit if topics are different. Graduate degree credit will not be given for both MUED 477V and MUED 577V. (Typically offered: Irregular) May be repeated for degree credit.

MUED 5811. Curriculum Design in Music. 1 Hour.

Goals and objectives in music education. Student will develop a curriculum for an actual or hypothetical music education program. (Typically offered: Irregular)

MUED 583V. Workshop: Music in the Elementary School. 1-18 Hour.

An in-service training workshop for elementary music teachers. (Typically offered: Irregular)

MUED 5862. Marching Band Techniques. 2 Hours.

Includes the place of the marching band in the school program, types of formations used, and selecting, arranging or writing the musical score. (Typically offered: Irregular)

MUED 5973. Tests and Measurement in Music. 3 Hours.

This course will address the psychometric concepts of tests and measurement of music achievement, aptitude, attitude, and self-assessment. The course will focus on the teaching and assessment of musical skills, musical responses, and will critically examine existing aptitude tests (Seashore, Watkins Farnum, Gordon, etc.). Basic statistical concepts and data analysis used in common testing scenarios will be introduced. Prerequisite: Graduate standing in music. (Typically offered: Irregular)

MUED 5983. Psychology of Music Behavior. 3 Hours.

This course is an introduction to the psychology of music, and will adopt an interdisciplinary view toward the field, covering such topics as philosophical and sociological questions about the nature and function of music, the physiology of the ear, the physical and perceptual properties of sounds (acoustics), performance anxiety, preference and taste research, social and pedagogical attributes of performance, and behavioral musical responses. Prerequisite: Graduate standing. (Typically offered: Irregular)

MUED 600V. Master's Thesis. 1-6 Hour.

Preparation of a master's thesis as partial fulfillment of the requirement for the master's degree. (Typically offered: Irregular) May be repeated for degree credit.

MUED 605V. Independent Study. 1-6 Hour.

Provides students with an opportunity to pursue special study of problems in music education. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Music Ensemble Courses

MUEN 5211. Latin American Ensemble. 1 Hour.

This ensemble plays music of Latin America with particular focus on Afro-Caribbean music and its performance practices. Students will have an opportunity to perform, improvise, arrange and compose in a variety of styles such as Son, Danzon, Cha-Cha-Cha, Mambo, Latin Jazz, Salsa, and Timba. The ensemble will perform at least one concert per semester and occasionally will perform at other activities on and off campus. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5221. World Music Ensemble. 1 Hour.

Students in the World Music Ensemble will closely study music and practices from a variety of musical cultures, while simultaneously acquiring solid grounding in music theory, musicianship skills, music history, and literature. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5231. Songwriters' Ensemble. 1 Hour.

A combined songwriting course and contemporary music ensemble. Students build a portfolio of original songs while studying elements of modern songwriting including harmony, lyrics, form, arranging, production and style. The class acts as an ensemble to present a recital of original music for the final performance. (Typically offered: Fall) May be repeated for up to 2 hours of degree credit.

MUEN 5241. Beginning Jazz Combo. 1 Hour.

Introductory ensemble experience offering a repertoire-based approach to learning basic improvisation skills and the performance of common jazz styles. Open to both music and non-music majors. (Typically offered: Spring)

MUEN 5251. Arkansas Soul Band. 1 Hour.

Perform historical and contemporary popular music from the African American tradition. These genres include, but are not limited to, soul, blues, funk, R&B, and hip-hop. Students will develop arranging and musical direction skills, as well as analysis of performance, arrangements, and compositions/songwriting in these styles. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5261. Intermediate Jazz Combo. 1 Hour.

Intermediate small jazz ensemble focused on improvisation in the context of bebop, free jazz, fusion, and related styles. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5271. Advanced Jazz Combo. 1 Hour.

Advanced small jazz ensemble focused on improvisation in the context of bebop, free jazz, fusion, and related styles. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5401. Opera Theatre. 1 Hour.

Study of opera through performances of scenes, chamber and major operatic production. Admission with director's approval. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5411. Men's Chorus. 1 Hour.

Performance-based choral ensemble designed to improve individual and collective vocal skills, develop sight-reading skills, improve the individual's grasp of the essential elements of music, and expose students to repertory of the greater men's chorus canon. Admission is open to any male student on campus. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5421. Inspirational Chorale. 1 Hour.

Performance of African-American literature with particular emphasis on Negro spirituals, traditional/contemporary gospel music and sacred world music. Rehearsal 3 hours per week. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5431. Symphony Orchestra. 1 Hour.

Rehearsal 3 hours per week with extra rehearsals at director's discretion. Admission with director's approval. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5441. Marching Band. 1 Hour.

Rehearsal 8 hours per week. Admission with director's approval. (Typically offered: Fall) May be repeated for degree credit.

MUEN 5451. Schola Cantorum. 1 Hour.

Vocal ensemble limited to the more experienced singers. Rehearsal 5 hours per week. Admission with director's approval. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5461. Wind Symphony. 1 Hour.

Rehearsal 3 to 5 hours per week. Admission by audition and approval of the conductor. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5471. Jazz Orchestra. 1 Hour.

Training in the various styles of jazz and popular music. Rehearsal 3 hours per week. Admission by audition. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5481. Campus Band. 1 Hour.

Rehearsal 3 hours per week. Admission by audition and approval of the conductor. (Typically offered: Spring) May be repeated for degree credit.

MUEN 5491. Concert Band. 1 Hour.

Large ensemble setting with emphasis on performing wind band literature and enhancing the musicianship of members. Focus on performance standards through style and interpretation. Concerts of artistic merit which serve the campus community and general public may be required. Admission is by audition or special approval. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5501. Chamber Music. 1 Hour.

Performance of small ensemble music for any combination of instruments and/or voice. Rehearsal 3 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5521. Woodwind Quintet. 1 Hour.

Study and performance of music for woodwind quintet. Weekly coaching will emphasize intonation, blend, stylistic awareness, and ensemble precision. Repertoire ranges from the 18th to the 20th centuries. 3 hours of rehearsals weekly. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5541. Accompanying. 1 Hour.

Piano accompanying of vocal and instrumental soloists. Rehearsal 2 hours per week. Pre- or Corequisite: MUAP 510V. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5551. Percussion Ensemble. 1 Hour.

Study and performance of ensemble music for multiple percussion instruments. Rehearsal 2 hours per week. (Typically offered: Spring and Summer) May be repeated for degree credit.

MUEN 5561. Musical Theater Orchestra. 1 Hour.

Instrumental ensemble with focus on the preparation and performance of musical theater pit orchestra music, in conjunction with UA Theater's mainstage musical. Admission by audition or director's approval. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 2 hours of degree credit.

MUEN 5591. Women's Chorus. 1 Hour.

Select performance-based choral ensemble designed to improve individual and collective vocal skills, develop sight-reading skills, improve the individual's grasp of the essential elements of music, and expose students to repertory of the greater treble chorus canon. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5691. Wind Ensemble. 1 Hour.

Large ensemble setting performing orchestral wind and symphonic band literature with emphasis on high performance standards through style and interpretation. Concerts of high artistic merit which serve the campus community and general public are required. Admission is by audition. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5721. Clarinet Ensemble. 1 Hour.

Study and performance of music for multiple clarinets, including trios, quartets, quintets, and clarinet choir. Rehearsal 2 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5751. Trumpet Ensemble. 1 Hour.

Study and performance of music for multiple trumpets, including trios, quartets, quintets, and trumpet choir. Rehearsal 2 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5761. New Music Ensemble. 1 Hour.

Small, select ensemble with emphasis on music written in the last hundred years, especially by important living composers. Focus on audience engagement through high performance standards, unconventional settings, and programs unique to the region. Off-campus appearances and outreach activities are required. Admission by consent. (Typically offered: Fall and Spring)

MUEN 5771. Trombone Ensemble. 1 Hour.

Study and performance of music for multiple trombones, including trios, quartets, quintets, and trombone choir. Rehearsal 2 hours per week. (Typically offered: Irregular) May be repeated for degree credit.

MUEN 5781. Tuba Ensemble. 1 Hour.

Study and performance of music for multiple combinations of tuba and euphonium, including trios, quartets, quintets, and low brass choir. Rehearsal 2 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5881. Chamber Choir. 1 Hour.

Continuation of Chamber Choir V for graduate students. Study and performance of vocal chamber music. Rehearsal 2 hours per week for 1 hour of credit. (Typically offered: Fall and Spring)

Music History Courses

MUHS 5253. Special Topics in Music History. 3 Hours.

Topics in world, Western, and popular musics. May be required based on graduate musicology entrance exam. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

MUHS 5563. Collaborative Piano Literature I, Woodwind and Brass Repertoire. 3 Hours.

Survey of collaborative literature for piano and wind or brass instruments. Focus on music for the collaborative duo (instrument and piano) including sonatas and concerti. (Typically offered: Fall Even Years)

MUHS 5573. Collaborative Piano Literature II, String Repertoire. 3 Hours.

Survey of collaborative literature for the piano. Focus on the repertoire of sonatas, concerti and concert works for the piano and instrument (violin, viola, cello, and double bass). (Typically offered: Spring Odd Years)

MUHS 5633. Survey of Symphonic Literature. 3 Hours.

(Formerly MUHS 4733.) A survey of the symphonic literature from its beginning to the present. Graduate degree credit will not be given for both MUHS 4733 and MUHS 5633. (Typically offered: Spring Even Years)

MUHS 5673. Survey of Vocal Literature II. 3 Hours.

(Formerly MUHS 4773.) A survey of concert literature for the solo voice. Graduate degree credit will not be given for both MUHS 4773 and MUHS 5673. Prerequisite: MUHS 4763. (Typically offered: Spring Odd Years)

MUHS 5693. Band Literature. 3 Hours.

(Formerly MUHS 4793.) A study of literature written for performance by concert band, symphonic band, and wind ensemble, representative of the following five periods in Music History: Renaissance (1420-1600), Baroque (1600-1750), Classical (1750-1820), Romantic (1820-1900), and Contemporary (1900-present). Graduate degree credit will not be given for both MUHS 4793 and MUHS 5693. (Typically offered: Irregular)

MUHS 5703. Survey of String Literature. 3 Hours.

(Formerly MUHS 4703.) A survey of solo and chamber music literature involving stringed instruments. Graduate degree credit will not be given for both MUHS 4703 and MUHS 5703. Prerequisite: MUAP 110V and MUTH 3613. (Typically offered: Fall Even Years)

MUHS 5722. Directed Studies in Music Literature I. 2 Hours.

Research in music literature in the performance field of the individual student. (Typically offered: Fall and Spring)

MUHS 5732. Directed Studies in Music Literature II. 2 Hours.

Research in music literature in the performance field of the individual student. Prerequisite: MUHS 5722. (Typically offered: Fall and Spring)

MUHS 5763. Survey of Vocal Literature I. 3 Hours.

(Formerly MUHS 4763.) A survey of concert literature for the solo voice. Graduate degree credit will not be given for both MUHS 4763 and MUHS 5763. (Typically offered: Fall Even Years)

MUHS 5803. Survey of Keyboard Literature I. 3 Hours.

(Formerly MUHS 4803.) A survey of the piano works of outstanding composers. Graduate degree credit will not be given for both MUHS 4803 and MUHS 5803. Prerequisite: MUAP 110V. (Typically offered: Fall Even Years)

MUHS 5813. Survey of Keyboard Literature II. 3 Hours.

(Formerly MUHS 4813.) A survey of the piano works of outstanding composers. Graduate degree credit will not be given for both MUHS 4813 and MUHS 5813. Prerequisite: MUHS 4803. (Typically offered: Spring Odd Years)

MUHS 589V. Seminar in Music History. 1-4 Hour.

(Formerly MUHS 489V.) Subject matter not covered in other courses. With permission, may be repeated for credit if topics are different. Graduate degree will not be given for both MUHS 489V and MUHS 589V. (Typically offered: Irregular) May be repeated for degree credit.

MUHS 5903. Seminar in Musicology. 3 Hours.

Focuses on specialized topics and repertoires within the history of Western music and introduces students to musicological approaches to these subjects. Prerequisite: MUHS 5973 or instructor consent. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUHS 5952. Choral History and Literature I. 2 Hours.

Detailed study of choral history and literature from Gregorian chant to J.S. Bach. (Typically offered: Irregular)

MUHS 5962. Choral History and Literature II. 2 Hours.

Detailed study of choral history and literature from J.S. Bach to the present. (Typically offered: Irregular)

MUHS 5973. Seminar in Bibliography and Methods of Research. 3 Hours.

A survey of the methods and materials of musical research, including bibliography, methods of analysis, and style in the presentation of research results. Open to graduate students and to juniors in Honors. (Typically offered: Fall)

MUHS 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Music Pedagogy Courses

MUPD 5202. Voice Pedagogy I. 2 Hours.

Graduate-level study of the techniques and materials of teaching voice. (Typically offered: Irregular)

MUPD 5763. Piano Pedagogy. 3 Hours.

(Formerly MUPD 4863.) Analytical study and discussion of the various approaches to piano pedagogy and its application in individual/class instruction. Involves demonstration of principles through actual teaching of beginning, intermediate and upper level students. Graduate degree credit will not be given for both MUPD 4863 and MUPD 5763. (Typically offered: Spring Even Years)

MUPD 577V. Special Topics in Pedagogy. 1-6 Hour.

(Formerly MUPD 477V.) Subject matter not covered in other sources. With permission, may be repeated for credit if topics are different. Graduate degree credit will not be given for both MUPD 477V and MUPD 577V. (Typically offered: Irregular) May be repeated for degree credit.

MUPD 582V. Conducting. 1-4 Hour.

Private lessons of 1/2 hour and 1 hour conducting laboratory each week. Development of skills in conducting symphony, choral, opera, oratorio, ballet, and band repertoire. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

MUPD 599V. Special Workshop in Music. 1-6 Hour.

Presented by visiting master artist-teacher in various fields of music performance, teaching and composition. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

Music Theory Courses

MUTH 5322. Score Reading. 2 Hours.

(Formerly MUTH 4322.) A conductor's approach to the technique of score reading and analysis of orchestra, band, and choral scores for the purpose of preparing composition for rehearsal and performance. Graduate degree credit will not be given for both MUTH 4322 and MUTH 5322. (Typically offered: Fall)

MUTH 5343. Analytical Techniques. 3 Hours.

An intensive study of selected works from music literature. Schenkerian analysis, rhythmic analysis, and set theory analytical techniques will be studied and employed in addition to traditional harmonic and formal analysis. Prerequisite: MUTH 3613 or equivalent and graduate standing. (Typically offered: Irregular)

MUTH 5612. Orchestration. 2 Hours.

(Formerly MUTH 4612.) A continuation of study of the capabilities of the various orchestral and band instruments and their use in arrangement for ensembles, band, and orchestra. Scoring for orchestra. Graduate degree credit will not be given for both MUTH 4612 and MUTH 5612. Prerequisite: MUTH 3613. (Typically offered: Spring)

MUTH 5623. Pedagogy of Theory. 3 Hours.

Detailed study of methods of teaching undergraduates courses in music theory and aural perception. Prerequisite: Graduate standing. (Typically offered: Irregular)

MUTH 5643. Analysis of 20th Century Music. 3 Hours.

Study of 20th century music and analytic techniques including pitch class set theory and serial techniques. Prerequisite: Graduate standing. (Typically offered: Irregular)

MUTH 5672. Advanced Orchestration. 2 Hours.

A study of advanced principles of orchestral writing through individual projects in scoring and analysis. Prerequisite: MUTH 4612 or MUTH 5612 (formerly MUTH 4612) or equivalent. (Typically offered: Irregular)

MUTH 568V. Composition. 1-4 Hour.

Private lessons of one-half hour, and one hour of composition laboratory session each week. Development of skills in creative musical expression specifically for composition-theory majors - others admitted by consent. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUTH 5703. Writing Music Analysis. 3 Hours.

(Formerly MUTH 4703.) Analysis of music with an emphasis on analytical writing skills and the use of library source materials. Graduate degree credit will not be given for both MUTH 4703 and MUTH 5703. Prerequisite: MUTH 3603. (Typically offered: Spring)

MUTH 577V. Special Topics in Music Theory. 1-4 Hour.

(Formerly MUTH 477V.) Subject matter not covered in other courses. Graduate degree credit will not be given for both MUTH 477V and MUTH 577V. Prerequisite: Instructor consent. (Typically offered: Irregular) May be repeated for up to 4 hours of degree credit.

MUTH 599V. Independent Study in Music Theory. 1-6 Hour.

Provides students with an opportunity to pursue special study of topics in music theory. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

MUTH 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Nursing (NURS)

Susan Patton

Director

Eleanor Mann School of Nursing

Epley Center for Health Professions

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Eleanor Mann School of Nursing website (<http://nurs.uark.edu>)

Degrees Conferred:

M.S. in Nursing (NURS)

Doctor of Nursing Practice (NURS)

The Master of Science in Nursing (M.S.N.) Program: The program offered by the Eleanor Mann School of Nursing expands on the philosophy of the undergraduate nursing program and contributes to the mission of the College of Education and Health Professions and the University of Arkansas. Graduates of the M.S.N. are prepared to contribute to the nursing profession through the application of knowledge and skills in leadership, education, and clinical practice. Completion of the M.S.N. program provides the foundation for academic progression to a research or practice-focused doctoral program.

Graduates of the M.S.N. program will be able to:

- Promote evidence-based practice through problem identification and the critique of research findings
- Collaborate in policy development, resource management, and cost-effective care delivery
- Apply legal/ethical principles to promote a values-based professional practice
- Affect health care outcomes through advanced roles of clinician, teacher, manager, researcher, and consultant
- Utilize theories from nursing and other disciplines for decision making
- Advocate for access to quality health care for diverse populations
- Collaborate with other disciplines to design, deliver and evaluate health care services for diverse populations
- Provide leadership in education in a variety of clinical and academic settings

Doctor of Nursing Practice Program: The program provides the terminal degree for nurses who will assume leadership roles as practitioners or specialists in the field of nursing. There are two entry levels for students: 1) post completion of the baccalaureate degree in nursing and licensure as a registered nurse (RN), or 2) post completion of a master's degree in nursing that has resulted in national certification as an advanced practice nurse (nurse practitioner, clinical nurse specialist, nurse midwife, or nurse anesthetist). The online program is built upon the standards set forth by the American Association of Colleges of Nursing's Essentials of Doctoral Education for Advanced Nursing Practice (2006), and incorporates specialty standards of the Acute Care Nurse Practitioner Competencies (2004) and the National Association of Clinical Nurse Specialists (2009). As such, students completing the B.S.N. to D.N.P. program of study will be eligible to sit for the adult-geriatric acute care nurse practitioner (ACNP), the adult/geriatric clinical nurse specialist (CNS), or the Family Nurse Practitioner (FNP) certification exam offered by the American Nurses Credentialing Center (ANCC) based on the concentration completed. Students in both entry levels must complete a D.N.P. project and a minimum of 1,000 clinical hours while enrolled in a graduate program. Current advanced practice nurses who enter the program as post-master's students must complete clinical hours to supplement clinical hours completed in their master's program. A variety of distance learning methods will be used to expedite clinical requirements. However, students should anticipate several visits to the main campus during their program of study.

Upon completion of the program, graduates will be able to:

- Evaluate and utilize advanced knowledge and theories from nursing and related disciplines to solve complex health issues for individuals, aggregates, populations, and systems.
- Design, implement and evaluate strategies that promote and sustain quality improvement at the organizational and policy levels.
- Provide leadership in the transformation of health care through intra-professional collaboration, application of technology, and policy development.
- Incorporate evidence-based clinical prevention and health services for individuals, aggregates, and populations.
- Demonstrate clinical expertise, systems thinking, and accountability in designing, delivering, and evaluating evidence-based care to improve patient outcomes.

Primary Areas of Faculty Research: Job satisfaction, recruiting and retaining nursing faculty; cooperative testing; diversity and high-risk populations, student success, emotional intelligence; patient teaching and safety in the healthcare environment; advanced practice nurses' work environments, their interface among rural and underserved populations, and their impact on health care outcomes; fall prevention in community dwelling older adults; oral health; mobility in older adults; preventing falls in the acute care setting; transitional care; nursing education best practices; care giver issues in older adults with dementia; cultural and behavioral factors of obesity; health behaviors in children, nutrition beliefs and practices, executive function, motivational factors, cultural beliefs; research affecting the pediatric population; migrant childhood health; lactation assessment and education; infant immune system research; minority population and education; education and cultural evaluation among nursing students; infant feeding; childhood obesity; hematology; oncology; smoking cessation; improving outcomes in trauma care; rib Score and Protocol Pain management strategies in critical care; IA joint injection protocol development; CAMP Scores to measure trauma systems in US; CAMP scores to compare trauma systems in US to Brazil; pediatric autism spectrum disorders: Increasing evidence-based care in

primary care clinics; promoting NP practice in Arkansas; higher education and primary/secondary level student issues/concerns; obesity; PCORI; community-engaged research; diabetes; patient/family health education; mental health; implementation of a protocol for screening at-risk walk-in clinic patients for diabetes.

Requirements for M.S.N. in Nursing

The Master of Science in Nursing (M.S.N.) Program offered by the Eleanor Mann School of Nursing expands on the philosophy of the undergraduate nursing program and contributes to the mission of the College of Education and Health Professions and the University of Arkansas. Graduates of the M.S.N. are prepared to contribute to the nursing profession through the application of knowledge and skills in leadership, education, and clinical practice. Completion of the M.S.N. program provides the foundation for academic progression to a research or practice-focused doctoral program.

Admission Requirements for the Master of Science in Nursing Degree Program

- Admission to the University of Arkansas Graduate School (<http://grad.uark.edu/>) (Requires a \$60 non-refundable application fee)
- Admission to the Eleanor Mann School of Nursing MSN program (<https://forms.coehp.uark.edu/>) (requires a \$40 application fee)
- Completion of a nationally accredited professional degree program in nursing
- A 3.0 cumulative GPA on the last 60 credit hours of attempted coursework in previous nursing program
- Current unencumbered license to practice as a registered nurse
- Submission of official GRE scores taken within five years and indicating capacity for master's level work
- Submission of curriculum vitae or professional resume
- Completion of candidate interview
- Two letters of recommendation, one from a faculty member and one from an employer
- Qualified applicants will be admitted on a space available basis
- Applicants who do not meet the above requirements may be referred to the Graduate Admissions Committee for special consideration and may be required to fulfill additional prerequisites.

Progression Requirements for the Master of Science in Nursing Degree

Students are responsible for meeting the standards of academic and professional performance specified by the graduate programs in nursing. In order to progress in the program, students must adhere to the following:

- Grade requirements as outlined below
- Policies of the University of Arkansas Graduate School are on the Objectives and Regulations page (p. 424).
- Clinical Practice Guidelines as outlined in the Eleanor Mann School of Nursing Graduate Student Handbook in the Graduate Handbook (<https://nurs.uark.edu/degrees-offered/msn/graduate-handbook.php>).
- Clinical Compliance Guidelines as outlined in the Eleanor Mann School of Nursing Graduate Student Handbook also in the Graduate Handbook (<https://nurs.uark.edu/degrees-offered/msn/graduate-handbook.php>).
- Maintenance of an unencumbered registered nurse license
- Compliance with the nurse practice act(s) which regulate(s) the student's license(s)

Grade Requirements

1. A grade of "C" or lower may be earned in a nursing course only once.
2. A grade of "B" or better must be received upon repeat of the nursing course in order to progress in the program; courses may only be repeated once to achieve a grade of "B" or higher.
3. If a second "C" or lower is earned in a nursing course, the student will not be allowed to progress in the program, and will not be allowed to return to the program.
4. A student may only repeat a nursing course in which a "C" or lower has been received one time throughout the program. A student may only withdraw from a course one time.
5. Grades of "D" or "F" are not accepted for credit.

D.N.P. with Family Nurse Practitioner Concentration

Program Requirements: In addition to the general requirements of the Graduate School, students who have earned a Bachelor of Science in Nursing must complete a minimum of 78 hours with the following general requirements for the Doctor of Nursing Practice, while completing additional coursework in the Family Nurse Practitioner concentration. Several campus visits are required for program orientation, skills acquisition, and dissemination of scholarly work.

Admission Requirements and Procedures

- Admission to the University of Arkansas Graduate School (<http://grad.uark.edu/>) (Requires a \$60 non-refundable application fee)
- Admission to the Eleanor Mann School of Nursing DNP program (<https://forms.coehp.uark.edu/>) (requires a \$40 application fee)
- Completion of a nationally accredited professional degree program in nursing
- A 3.0 cumulative GPA on the last 60 credit hours of attempted coursework in previous nursing program
- Current unencumbered license to practice as a registered nurse
- Submission of official GRE scores taken within 5 years and indicating capacity for doctoral-level work
- Submission of curriculum vitae or professional resume
- Completion of candidate interview
- Two letters of recommendation, one from a faculty member and one from an employer
- Additional Requirements for master's-prepared Advanced Practice Registered Nurse applicants:
 - Completion of a Master's Degree in Nursing from a nationally accredited M.S.N. program
 - A.P.N. licensure – if required by student's state of residence
 - Certification as an A.P.N.
- Qualified applicants will be admitted on a space available basis
- Applicants who do not meet the above requirements may be referred to the Graduate Admissions Committee for special consideration and may be required to fulfill additional prerequisites.

Progression Requirements for the Doctor of Nursing Practice Degree:

Students are responsible for meeting the standards of academic and professional performance specified by the graduate programs in nursing. In order to progress in the program, students must adhere to the following:

- Grade requirements as outlined below
- See also Policies of the University of Arkansas Graduate School (p. 424).
- Clinical Practice Guidelines (https://nursing.uark.edu/_resources/pdfs/msn-dnp-handbook-2019_20_rev-0120.pdf) as outlined in the Handbook.
- Clinical Compliance Guidelines (https://nursing.uark.edu/_resources/pdfs/msn-dnp-handbook-2019_20_rev-0120.pdf) as outlined in the Handbook.
- Maintenance of an unencumbered registered nurse license
- Compliance with the nurse practice act(s) which regulate(s) the student's license(s)

Grade Requirement

A. A grade of "C" or lower may be earned in a nursing course only once, with the following exception:

1. A grade of "B" or better must be earned in didactic courses with a clinical component.
2. If a grade less than "B" is earned in either the didactic or clinical course, both must be repeated concurrently. A grade of "B" or better must be received upon repeat of the course in order to progress in the program.
3. Clinical courses and their didactic components may only be repeated once to achieve a grade of "B" or higher.

B. If a second "C" or lower is earned in a nursing course, the student will not be allowed to progress in the program, and will not be allowed to return to the program.

C. A student may only repeat a nursing course in which a "C" or lower has been received one time throughout the program. A student may only withdraw from a course one time.

D. Grades of "D" or "F" are not accepted for credit.

Required Courses for All D.N.P. Students

NURS 5063	Health Care Policy	3
NURS 5523	Healthcare Informatics	3
NURS 6123	Evaluation Methods and Translational Research for Evidence-based Practice	3
NURS 6224	DNP Clinical Practicum I (180 contact hours)	4
NURS 6233	Healthcare Economics and Finance	3
NURS 6244	DNP Clinical Practicum II (180 contact hours)	4
NURS 6263	Organization Management and Systems Leadership	3
NURS 628V	DNP Clinical Practicum III	3
NURS 7122	DNP Project Implementation I	2
NURS 7142	DNP Project Implementation II	2
NURS 6343	Analytic Methods and Epidemiology for Health Care	3
NURS 5403	Scholarly Writing	3
ESRM 5393	Statistics in Education and Health Professions	3

Additional Requirements for Family Nurse Practitioner Concentration

Required courses for all B.S.N.-D.N.P. students:

NURS 5033	Scientific Foundations and Role Development in Advanced Practice Nursing	3
NURS 5043	Concepts of Health Promotion Within Diverse Populations	3
NURS 5053	Evidence-Based Practice and Innovation in Nursing	3
NURS 5101	Advanced Health Assessment and Diagnostic Reasoning	1
NURS 5112	Advanced Health Assessment and Diagnostic Reasoning Clinical Practicum	2
NURS 5123	Pharmacotherapeutics	3
NURS 5143	Advanced Pathophysiology	3

Required Family Nurse Practitioner Courses

NURS 5483	Common Problems in Primary Care	3
NURS 5495	Common Problems in Primary Care Clinical Practicum	5
NURS 5543	Primary Care of Children	3
NURS 5683	Primary Care of Children Clinical Practicum	3
NURS 5873	Complex Problems in Primary Care	3
NURS 5884	Complex Problems in Primary Care Clinical Practicum	4

D.N.P. with Adult-Gerontology Acute-Care Nurse Practitioner Concentration

Program Requirements: In addition to the general requirements of the Graduate School, students who have earned a Bachelor of Science in Nursing must complete a minimum of 78 hours with the following general requirements for the Doctor of Nursing Practice, while completing additional coursework in the Adult-Gerontology Acute-Care Nurse Practitioner concentration. Several campus visits are required for program orientation, skills acquisition, and dissemination of scholarly work.

Admission Requirements and Procedures

- Admission to the [University of Arkansas Graduate School \(http://grad.uark.edu/\)](http://grad.uark.edu/) (Requires a \$60 non-refundable application fee)
- Admission to the [Eleanor Mann School of Nursing DNP program \(https://forms.coehp.uark.edu/\)](https://forms.coehp.uark.edu/) (requires a \$40 application fee)
- Completion of a nationally accredited professional degree program in nursing
- A 3.0 cumulative GPA on the last 60 credit hours of attempted coursework in previous nursing program
- Current unencumbered license to practice as a registered nurse
- Submission of official GRE scores taken within 5 years and indicating capacity for doctoral-level work
- Submission of curriculum vitae or professional resume
- Completion of candidate interview
- Two letters of recommendation, one from a faculty member and one from an employer
- Additional Requirements for master's-prepared Advanced Practice Registered Nurse applicants:
 - Completion of a Master's Degree in Nursing from a nationally accredited M.S.N. program
 - A.P.N. licensure – if required by student's state of residence
 - Certification as an A.P.N.

- Qualified applicants will be admitted on a space available basis
- Applicants who do not meet the above requirements may be referred to the Graduate Admissions Committee for special consideration and may be required to fulfill additional prerequisites.

Progression Requirements for the Doctor of Nursing Practice Degree:

Students are responsible for meeting the standards of academic and professional performance specified by the graduate programs in nursing. In order to progress in the program, students must adhere to the following:

- Grade requirements as outlined below
- See also Policies of the University of Arkansas Graduate School (p. 424).
- Clinical Practice Guidelines (https://nursing.uark.edu/_resources/pdfs/msn-dnp-handbook-2019_20_rev-0120.pdf) as outlined in the Handbook.
- Clinical Compliance Guidelines (https://nursing.uark.edu/_resources/pdfs/msn-dnp-handbook-2019_20_rev-0120.pdf) as outlined in the Handbook.
- Maintenance of an unencumbered registered nurse license
- Compliance with the nurse practice act(s) which regulate(s) the student's license(s)

Grade Requirement

A. A grade of "C" or lower may be earned in a nursing course only once, with the following exception:

1. A grade of "B" or better must be earned in didactic courses with a clinical component.
2. If a grade less than "B" is earned in either the didactic or clinical course, both must be repeated concurrently. A grade of "B" or better must be received upon repeat of the course in order to progress in the program.
3. Clinical courses and their didactic components may only be repeated once to achieve a grade of "B" or higher.

B. If a second "C" or lower is earned in a nursing course, the student will not be allowed to progress in the program, and will not be allowed to return to the program.

C. A student may only repeat a nursing course in which a "C" or lower has been received one time throughout the program. A student may only withdraw from a course one time.

D. Grades of "D" or "F" are not accepted for credit.

Required Courses for All D.N.P. Students

NURS 5063	Health Care Policy	3
NURS 5523	Healthcare Informatics	3
NURS 6123	Evaluation Methods and Translational Research for Evidence-based Practice	3
NURS 6224	DNP Clinical Practicum I (180 contact hours)	4
NURS 6233	Healthcare Economics and Finance	3
NURS 6244	DNP Clinical Practicum II (180 contact hours)	4
NURS 6263	Organization Management and Systems Leadership	3
NURS 628V	DNP Clinical Practicum III	3
NURS 7122	DNP Project Implementation I	2

NURS 7142	DNP Project Implementation II	2
NURS 6343	Analytic Methods and Epidemiology for Health Care	3
NURS 5403	Scholarly Writing	3
ESRM 5393	Statistics in Education and Health Professions	3

Additional Requirements for Adult-Geriatric Acute-Care Nurse Practitioner Concentration

Required courses for all B.S.N.-D.N.P. students:

NURS 5033	Scientific Foundations and Role Development in Advanced Practice Nursing	3
NURS 5043	Concepts of Health Promotion Within Diverse Populations	3
NURS 5053	Evidence-Based Practice and Innovation in Nursing	3
NURS 5101	Advanced Health Assessment and Diagnostic Reasoning	1
NURS 5112	Advanced Health Assessment and Diagnostic Reasoning Clinical Practicum	2
NURS 5123	Pharmacotherapeutics	3
NURS 5143	Advanced Pathophysiology	3

Required Adult Gerontology Acute-Care Nurse Practitioner Courses

NURS 5463	Acute and Critical Illness in Adult and Gerontology Populations	3
NURS 5475	Acute and Critical Illness in Adult and Gerontology Populations Clinical Practicum	5
NURS 5434	Common Problems in Acute Care in Adult and Gerontology Populations	4
NURS 5332	Common Problems in Acute Care in Adult and Gerontology Populations Clinical Practicum	2
NURS 5443	Chronic Health Problems in Adult and Gerontology Populations	3
NURS 5454	Chronic Health Problems in Adult and Gerontology Populations Clinical Practicum	4

Post-M.S.N. Doctor of Nursing Practice

Program Requirements: In addition to the general requirements of the Graduate School, students who have earned a clinical Master of Science in Nursing degree must complete a minimum of 42 hours with the following requirements for the Doctor of Nursing Practice. Several campus visits may be required for program orientation and dissemination of scholarly work.

Admission Requirements and Procedures

- Admission to the [University of Arkansas Graduate School \(http://grad.uark.edu/\)](http://grad.uark.edu/) (Requires a \$60 non-refundable application fee)
- Admission to the [Eleanor Mann School of Nursing DNP program \(https://forms.coehp.uark.edu/\)](https://forms.coehp.uark.edu/) (requires a \$40 application fee)
- Completion of a nationally accredited professional degree program in nursing
- A 3.0 cumulative GPA on the last 60 credit hours of attempted coursework in previous nursing program
- Current unencumbered license to practice as a registered nurse

- Submission of official GRE scores taken within 5 years and indicating capacity for doctoral-level work
- Submission of curriculum vitae or professional resume
- Completion of candidate interview
- Two letters of recommendation, one from a faculty member and one from an employer
- Additional Requirements for master's-prepared Advanced Practice Registered Nurse applicants:
 - Completion of a Master's Degree in Nursing from a nationally accredited M.S.N. program
 - A.P.N. licensure – if required by student's state of residence
 - Certification as an A.P.N.
- Qualified applicants will be admitted on a space available basis
- Applicants who do not meet the above requirements may be referred to the Graduate Admissions Committee for special consideration and may be required to fulfill additional prerequisites.

Progression Requirements for the Doctor of Nursing Practice Degree:

Students are responsible for meeting the standards of academic and professional performance specified by the graduate programs in nursing. In order to progress in the program, students must adhere to the following:

- Grade requirements as outlined below
- See also Policies of the University of Arkansas Graduate School (p. 424).
- Clinical Practice Guidelines (https://nursing.uark.edu/_resources/pdfs/msn-dnp-handbook-2019_20_rev-0120.pdf) as outlined in the Handbook.
- Clinical Compliance Guidelines (https://nursing.uark.edu/_resources/pdfs/msn-dnp-handbook-2019_20_rev-0120.pdf) as outlined in the Handbook.
- Maintenance of an unencumbered registered nurse license
- Compliance with the nurse practice act(s) which regulate(s) the student's license(s)

Grade Requirement

A. A grade of "C" or lower may be earned in a nursing course only once, with the following exception:

1. A grade of "B" or better must be earned in didactic courses with a clinical component.
2. If a grade less than "B" is earned in either the didactic or clinical course, both must be repeated concurrently. A grade of "B" or better must be received upon repeat of the course in order to progress in the program.
3. Clinical courses and their didactic components may only be repeated once to achieve a grade of "B" or higher.

B. If a second "C" or lower is earned in a nursing course, the student will not be allowed to progress in the program, and will not be allowed to return to the program.

C. A student may only repeat a nursing course in which a "C" or lower has been received one time throughout the program. A student may only withdraw from a course one time.

D. Grades of "D" or "F" are not accepted for credit.

Required Courses for All D.N.P. Students

NURS 5063	Health Care Policy	3
NURS 5523	Healthcare Informatics	3
NURS 6123	Evaluation Methods and Translational Research for Evidence-based Practice	3
NURS 6224	DNP Clinical Practicum I (180 contact hours)	4
NURS 6233	Healthcare Economics and Finance	3
NURS 6244	DNP Clinical Practicum II (180 contact hours)	4
NURS 6263	Organization Management and Systems Leadership	3
NURS 628V	DNP Clinical Practicum III	3
NURS 7122	DNP Project Implementation I	2
NURS 7142	DNP Project Implementation II	2
NURS 6343	Analytic Methods and Epidemiology for Health Care	3
NURS 5403	Scholarly Writing	3
ESRM 5393	Statistics in Education and Health Professions	3

Requirements for Graduate Certificate in Nursing Education

Program Description: This Graduate Certificate in Nursing Education program will prepare the next generation of nurse educators for the role in academic settings. Students augment their existing Master's preparation in the clinical setting with knowledge and skills to function as qualified nursing educators ready for the demands of the academic setting. The students completing this certificate fill the needs of nursing education programs across the country at all levels. The program is offered 100% online.

Program Requirements: The semester of entry can be spring, summer, or fall. The courses listed below must be completed. The NURS 5343 Specialty Development I (Teaching Practicum) course will be the last course in the sequence. Students opting to enroll beginning fall or summer will be required to take only NURS 5073 in the fall (not NURS 5343) followed by one course each semester with completion the following fall. Students entering in spring will complete NURS 5093 first, followed by NURS 5083 in the summer and NURS 5073 and NURS 5343 in the fall.

NURS 5073	Curriculum Design and Development in Nursing Education	3
NURS 5083	Methods of Assessment and Evaluation in Nursing Education	3
NURS 5093	Instructional Design and Delivery in Nursing Education	3
NURS 5343	Specialty Development I	3
Total Hours		12

Graduate Faculty Courses

NURS 5003. Theoretical and Scientific Foundations for Nursing Practice. 3 Hours.

The course utilizes the critical reasoning process to examine the element of nursing knowledge. Emphasis is placed on concept analysis and the evaluation of nursing theories. Identification of the links between theory and empirical indicators is examined. The clinical relevance of mid-range and practice theories is explored. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 5033. Scientific Foundations and Role Development in Advanced Practice Nursing. 3 Hours.

Examines development of the advanced practice nursing role and evolution of the Doctor of Nursing Practice (DNP). Concepts include scientific foundations of practice, role development, interdisciplinary collaborative strategies, advanced scope of practice, patient advocacy, and legal/ethical principles in the advanced practice role. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 5043. Concepts of Health Promotion Within Diverse Populations. 3 Hours.

Provides a theoretical base for health promotion, risk reduction and disease prevention at the individual, family and community levels. A cross-disciplinary approach to achieve or preserve health is identified. Focuses on holistic plans and interventions that address the behavioral and social factors that contribute to morbidity and mortality in diverse populations. Provides opportunity to develop, implement, and evaluate health promotion interventions for selected clients. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Spring)

NURS 5053. Evidence-Based Practice and Innovation in Nursing. 3 Hours.

Examines models and strategies for leadership in evidence-based practice and innovation, outcomes management, and translational scholarship. The emphasis of this course is on problem identification, information retrieval, critical appraisal, and synthesis of a body of evidence. It provides the student with the foundation for MSN and DNP evidence-based projects. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Spring)

NURS 5063. Health Care Policy. 3 Hours.

Provides knowledge and understanding needed to participate in policy development analysis and implementation. Provides an overview of the political process, health care policy, advocacy, leadership roles, legislative and regulatory issues, health care financing, and evaluating outcomes. Access, cost, and quality of health care are major foci in this course. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Summer)

NURS 5073. Curriculum Design and Development in Nursing Education. 3 Hours.

This course provides the essential elements that define and operationalize the process of curriculum design and development. Students will examine curriculum theories, models, and concepts from the perspective of nursing education. They will analyze factors that influence program and curriculum development. Historical and philosophical foundations of nursing practice and educational principles are examined. The application and synthesis of curriculum theory and their application to nursing is emphasized. The role of the educator in the dynamic relationship between the practice setting, research, and curriculum is examined. Students will participate in the design of curriculum which reflects professional nursing practice, standards, theory, and research. Prerequisite: Admission to the Graduate Program or departmental consent. Completion of all general and research core classes or approval of the MSN Education Program Coordinator. (Typically offered: Fall and Spring)

NURS 5083. Methods of Assessment and Evaluation in Nursing Education. 3 Hours.

This course is one of four offered in the nursing education concentration in preparation for the role of educator in academic and clinical settings. Students explore theories, models, and evidence for best practice in assessing learning - including constructing exam items and creating tools for assessing writing assignments. Students discuss grading and other concepts related to assessment and evaluation as it relates to nursing education. Pre- or Corequisite: Completion of NURS 5073 or NURS 5093. Prerequisite: Admission to the Masters of Science in Nursing or the Doctor of Nursing Practice Program. (Typically offered: Summer)

NURS 5093. Instructional Design and Delivery in Nursing Education. 3 Hours.

This course is one of four offered in the nursing education concentration in preparation for the role of educator in academic and clinical settings. Students explore teaching and learning theories and other evidence to guide practice in the advanced role of the educator. Students gain competencies in the knowledge and skills necessary for delivering evidence-based teaching and learning strategies in a variety of learning environments. Prerequisite: Admission to the Graduate Program or departmental consent. (Typically offered: Spring)

NURS 5101. Advanced Health Assessment and Diagnostic Reasoning. 1 Hour.

Applies health assessment, physical examination techniques, clinical decision making, and diagnostic reasoning to formulate a culturally-sensitive, individualized plan of care, which includes health promotion and disease prevention. Corequisite: NURS 5112. (Typically offered: Fall)

NURS 5112. Advanced Health Assessment and Diagnostic Reasoning Clinical Practicum. 2 Hours.

Focus is on the application of clinical decision making, diagnostic reasoning, and advanced physical examination techniques to develop differential diagnoses, problem list, and a plan of care for individual clients. Corequisite: NURS 5101. (Typically offered: Fall)

NURS 5123. Pharmacotherapeutics. 3 Hours.

Provides advanced concepts and application of pharmacology for broad categories of agents used in disease management. Establishes the relationship between pharmacologic agents and physiologic/pathologic responses. It assists students with the development of knowledge and skills to prescribe and manage a client's health in a safe, high quality, and cost-effective manner. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Spring)

NURS 5143. Advanced Pathophysiology. 3 Hours.

Provides a comprehensive understanding of normal physiologic and pathologic mechanisms of disease that serves as a foundation for clinical assessment, decision making, and management of individuals. Includes mechanisms of disease, genetic susceptibility, and immune responses in selected disorders. This course includes concepts of pathophysiology across the lifespan. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 5272. Clinical Practicum: Interpretive Diagnostic Reasoning. 2 Hours.

Application of principles of pathologic mechanisms of disease, pharmacotherapeutics, and pharmacokinetics to refine and synthesize skills for history taking, physical examination, clinical assessment, diagnostic reasoning, and decision making for adult and geriatric individuals. Pre- or Corequisite: NURS 5101, NURS 5112, NURS 5143 and NURS 5123. (Typically offered: Summer)

NURS 5303. Foundations of Nursing Education. 3 Hours.

Considers the principles, philosophies, theories, and strategies of teaching, learning, and evaluation needed in nursing education. (Typically offered: Fall)

NURS 5313. Curriculum and Evaluation in Nursing Education. 3 Hours.

Considers knowledge and skills needed for curriculum and program development and evaluation for a variety of nursing education settings. (Typically offered: Summer)

NURS 5323. Teaching in Nursing Practicum. 3 Hours.

Supervised experience in the nurse educator role in both classroom and clinical settings. (Typically offered: Fall)

NURS 5332. Common Problems in Acute Care in Adult and Gerontology Populations Clinical Practicum. 2 Hours.

Focuses on the management of adult-gerontology patients with common acute illnesses. Emphasizes the application of principles of pathologic mechanisms of disease, history taking, physical examination, and clinical decision making. Corequisite: NURS 5434. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5343. Specialty Development I. 3 Hours.

This course will include two foci. There will be readings focused on current topics in a specialty area. A focused field experience will allow student to integrate knowledge and skills in a specialty area of nursing in preparation for the nurse educator role. (Typically offered: Spring)

NURS 5353. Specialty Development II. 3 Hours.

Building on the Independent Study: Specialty Development I, this course will include two foci. There will be readings focused on current topics in a specialty area. A focused field experience will allow student to integrate knowledge and skills in a specialty area of nursing in preparation for the nurse educator role. Prerequisite: NURS 5343. (Typically offered: Fall)

NURS 5403. Scholarly Writing. 3 Hours.

This course will focus on the fundamentals of academic writing at the graduate level with the goal of honing students' critical reading and writing skills. Attention will be given to mechanics, usage, and style, as well as to handling and citing sources. The emphasis throughout is on creative thinking and precise, scholarly writing. Prerequisite: Completion of a baccalaureate degree and acceptance into the graduate program. (Typically offered: Fall and Summer)

NURS 5413. Executive Leadership in Nursing. 3 Hours.

This course focuses on the health care structures and processes, human capital management, health and public policy, communication principles and styles, negotiations, leadership effectiveness, strategic visioning, ethics and advocacy, and innovation. Learning will enable the professional nurse executive to lead complex health care environments applying an advanced skill set in each of the focus areas. Prerequisite: NURS 5403, NURS 5523, NURS 5043, NURS 5053, NURS 5063, MBAD 5241, HRWD 5233, NURS 6233, ESRM 6403. (Typically offered: Spring)

NURS 5423. Health Systems Operations. 3 Hours.

This course focuses on the complex practice environment. Enables the professional nurse leader to demonstrate knowledge of care management and delivery, professional practice environment and models, and quality monitoring and improvement. Professional practice and health care delivery models and settings, role delineation, laws and regulations, accreditation, and professional practice standards will be emphasized. Prerequisite: NURS 5403, NURS 5523, NURS 5043, NURS 5053, NURS 5063, MBAD 5241, HRWD 5233, NURS 6233, ESRM 6403. (Typically offered: Fall)

NURS 5434. Common Problems in Acute Care in Adult and Gerontology Populations. 4 Hours.

Examine principles of pathologic mechanisms of disease, refine skills for history taking, physical examination, and clinical decision making for adult and geriatric individuals with common acute illnesses. Corequisite: NURS 5443. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5443. Chronic Health Problems in Adult and Gerontology Populations. 3 Hours.

Explores evidence-based models for the management of selected chronic conditions, focusing on assessment and treatment of individuals and families. Utilizes advanced theories, concepts, knowledge, and skill in the care of diverse adult and geriatric populations with complex chronic health problems. Corequisite: NURS 5454. Prerequisite: Completion of NURS 5434 and NURS 5332. (Typically offered: Fall)

NURS 5454. Chronic Health Problems in Adult and Gerontology Populations Clinical Practicum. 4 Hours.

Focuses on the management of adult-gerontology populations with complex, chronic health problems. Emphasis is on the application of theoretical concepts, assessment skills, clinical decision making, and evidence-based standards to formulate diagnoses, clinical impressions, treatment, and evaluation plans in the acute or out-patient setting. Corequisite: NURS 5443. Prerequisite: NURS 5434 and NURS 5332. (Typically offered: Fall)

NURS 5463. Acute and Critical Illness in Adult and Gerontology Populations. 3 Hours.

Provides an in-depth knowledge of management of acutely and critically ill adults. Emphasis is on the use of evidence-based knowledge to formulate diagnoses, treatment, evaluation plans, and referral for adults who have complex acute or critical health problems, or are at high risk for developing complications. Corequisite: NURS 5475. Prerequisite: NURS 5443 and NURS 5454. (Typically offered: Spring)

NURS 5475. Acute and Critical Illness in Adult and Gerontology Populations Clinical Practicum. 5 Hours.

Experiences allow the student to apply safe, scientifically sound, cost effective, legal and ethical management strategies to the care of adults with complex acute and critical illness. Emphasis is on the development of advanced clinical skills in acute and critical care settings. Corequisite: NURS 5463. Prerequisite: NURS 5443 and NURS 5454. (Typically offered: Spring)

NURS 5483. Common Problems in Primary Care. 3 Hours.

Examines principles of pathological mechanisms of disease, refines knowledge for thorough history taking, physical examination, and clinical decision-making for men, women, and families with common illnesses treated in primary care. Includes anticipatory guidance, health promotion, disease prevention, and reproductive health. Corequisite: NURS 5495. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5495. Common Problems in Primary Care Clinical Practicum. 5 Hours.

Clinical component to 5483 Common Problems Primary Care. Refines skills for thorough history taking, physical examination, and clinical decision-making for men, women, and families with common illnesses treated in primary care as well as health promotion, disease prevention, and reproductive health needs. Corequisite: NURS 5483. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5523. Healthcare Informatics. 3 Hours.

Prepares graduate students to serve as leaders in the utilization of information systems and technology to support and improve education, patient care, and healthcare systems. Assists students in evaluating and integrating qualified technologies into various practice settings. Students will explore current and emerging trends in Healthcare Informatics and their legal, ethical, and political implications. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Summer)

NURS 5543. Primary Care of Children. 3 Hours.

Focuses on evidence-based models for the management of children from diverse cultures with common conditions in primary care. Includes anticipatory guidance, health promotion, and disease prevention. Emphasis on application of theoretical concepts, assessment skills, clinical decision-making, and evidence-based standards to formulate differential diagnoses, clinical impressions, treatment, and evaluation plans in primary care. Corequisite: NURS 5683. Prerequisite: NURS 5873 and NURS 5884. (Typically offered: Spring)

NURS 5683. Primary Care of Children Clinical Practicum. 3 Hours.

Focuses on the management of children in the clinical setting with emphasis on holistic assessment and treatment of this population and their families. Students will engage in the assessment, diagnosis and treatment of conditions common to primary practice in pediatric clinics. This course will consist of 135 contact hours. Corequisite: NURS 5543. Prerequisite: NURS 5873 and NURS 5884. (Typically offered: Spring)

NURS 579V. Independent Study. 1-3 Hour.

Independent study designed by student with faculty advisor. May be completed as alternative to thesis. (Typically offered: Fall, Spring and Summer)

NURS 5873. Complex Problems in Primary Care. 3 Hours.

Focuses on application of health promotion and chronic disease management in complex adult patients. Students will utilize evidence-based approaches to health promotion, assessment, differential diagnosis and disease management. Emphasizes clinical decision making, chronic care models, coordination of care, poly-drug therapy and information systems. Corequisite: NURS 5884. Prerequisite: NURS 5483 and NURS 5495. (Typically offered: Fall)

NURS 5884. Complex Problems in Primary Care Clinical Practicum. 4 Hours.

Clinical component to NURS 5873 Complex Problems in Primary Care. Offers the student an opportunity to exercise critical judgment and implement theoretical knowledge in the management of care of adults experiencing complex health problems. Corequisite: NURS 5873. Prerequisite: NURS 5495 and NURS 5483. (Typically offered: Fall)

NURS 598V. Nursing Special Topics. 1-6 Hour.

Special Topics course to fulfill national accrediting body for Family Nurse Practitioner. Prerequisite: NURSDP major. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

NURS 599V. Seminar. 1-3 Hour.

Selected topics in nursing explored in discussion format. (Typically offered: Irregular)

NURS 600V. Master's Thesis. 1-3 Hour.

Student research to fulfill degree requirement for the MSN. Prerequisite: NURS 5053. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

NURS 6123. Evaluation Methods and Translational Research for Evidence-based Practice. 3 Hours.

The translation of evidence into practice, including theoretical and practical challenges, is analyzed through the use of case studies and proposals. Uses methods of inquiry for systematic appraisal of nursing practice or healthcare programs to identify practice outcomes and create an environment to support and sustain changes. Prerequisite: NURS 6343 or by permission of the instructor. (Typically offered: Spring)

NURS 6224. DNP Clinical Practicum I. 4 Hours.

Provides an opportunity to synthesize advanced knowledge and role behaviors within a specialty concentration. Designed to apply nursing theory, translational research, epidemiologic principles, ethical/legal principles, outcome evaluations, healthcare systems thinking, and economics into a specialized clinical practice role and setting. Depending upon specialty and experience, may require travel to campus. Prerequisite: NURS 5443, NURS 5454, NURS 5463, and NURS 5475. (Typically offered: Summer)

NURS 6233. Healthcare Economics and Finance. 3 Hours.

Provides economic, financial, and business knowledge and skills required for a leadership role in financial planning and decision making within healthcare delivery systems. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 6244. DNP Clinical Practicum II. 4 Hours.

Provides an opportunity to synthesize advanced knowledge and role behaviors within a specialty concentration. Designed to apply nursing theory, translational research, epidemiologic principles, ethical/legal principles, outcome evaluations, healthcare systems thinking, and economics into a specialized clinical practice role and setting. Depending upon specialty and experience, may require travel to campus. Corequisite: NURS 7122. Prerequisite: NURS 6224. (Typically offered: Fall)

NURS 6263. Organization Management and Systems Leadership. 3 Hours.

Facilitates understanding of how to lead, advocate, and manage innovative responses to organizational needs and challenges. Emphasizes development and evaluation of care delivery models that meet the needs of targeted patient populations by enhancing accountability for effective and efficient healthcare, quality improvement, and patient safety. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Summer)

NURS 628V. DNP Clinical Practicum III. 1-8 Hour.

Allows for the continuation of specialty role development and a more refined and advanced approach to care delivery, systems thinking, and leadership. Allows for the total number of practice hours required for certification and/or degree. Corequisite: NURS 5543, NURS 5683, NURS 5463, and NURS 5475. (Typically offered: Spring) May be repeated for up to 8 hours of degree credit.

NURS 6343. Analytic Methods and Epidemiology for Health Care. 3 Hours.

This course will examine the role of epidemiology and statistics in advanced nursing practice. The student will learn how the concepts of epidemiology are used to measure and describe the health of individuals and populations and apply statistical concepts and analytical methods to data encountered in practice. Major topics to be covered include sources of data, study designs, analytical strategies and interpretation of data related to disease causality, risk, and prevalence. Prerequisite: ESRM 5393. (Typically offered: Fall, Spring and Summer)

NURS 6862. Rural Primary Care in Arkansas. 2 Hours.

This is a rural health course elective for graduate nursing students. The purpose of this course is to prepare them for the role of nurse practitioner educator in the academic setting by providing additional knowledge and exposure to topics and diseases seen in rural primary care in Arkansas. (Typically offered: Fall and Spring)

NURS 6882. Opioid Use in Rural Arkansas. 2 Hours.

This course prepares graduate nursing students for the nurse practitioner role in rural settings by providing knowledge, exposure to risk factors, treatment strategies for opioid abuse and misuse, policies and regulations related to prescribing opioids, and gaps in community responses addressing this epidemic in rural primary care in Arkansas. (Typically offered: Fall and Spring)

NURS 7113. Capstone Seminar I. 3 Hours.

Designed to unify and organize the student's field of inquiry for the final Capstone Project. Emphasis is on the application of an evidence-based intervention suitable to their area of focus that involves appropriate methodology and application with the goal for change in practice or outcome analysis. Prerequisite: Completion of NURS 6224 and/or permission of the instructor. (Typically offered: Fall)

NURS 7122. DNP Project Implementation I. 2 Hours.

Provides necessary support and elements for students to begin execution of the DNP Project in collaboration with the sponsoring site. (Typically offered: Fall)

NURS 7132. Capstone Seminar II. 2 Hours.

Focuses on data exploration and analysis for the organization and refinement of all aspects of Capstone Project, emphasizing implementation and evaluation of the evidence-based intervention. Allows student to finalize the scholarly written and oral report for dissemination of results. Corequisite: NURS 7142. Prerequisite: NURS 7113 and NURS 7122. (Typically offered: Spring)

NURS 7142. DNP Project Implementation II. 2 Hours.

Provides an avenue for students to complete and disseminate the DNP project. Allows students the opportunity to synthesize and demonstrate the ability to employ effective communication and collaboration skills, leadership roles, influence healthcare quality and safety, evaluate practice, and successfully negotiate change in healthcare delivery for individuals, families, populations, or systems. Prerequisite: NURS 7122. (Typically offered: Spring)

Occupational Therapy (OCTH)

Sherry Muir

Program Director

231 Graduate Education Building

751 West Maple Avenue

Fayetteville, AR

479-575-8727 (office)

Email: otd@uark.edu

Occupational Therapy Website (<https://hhpr.uark.edu/ot/>)

Degrees Awarded:

O.T.D. in Occupational Therapy (OTDEDP)

Program Description: The O.T.D. program is a 115-credit-hour, post-baccalaureate, 3-year (9 semester), full-time, on-campus program with an off-campus fieldwork and capstone component. Upon completion, an entry-level professional degree is awarded. This degree prepares graduates and meets requirements to sit for the National Board for the Certification of Occupational Therapy exam.

This degree is a joint offering between the College of Education and Health Professions of the University of Arkansas and the College of Health Professions of the University of Arkansas for Medical Sciences and UAMS's Northwest campus in Fayetteville. The department's mission embodies both institutions' shared aim to enhance the health, well-being, and quality of life of the people of Arkansas, our nation, and world. By enabling occupational therapy students to become innovative, caring, globally-minded scholars, practitioners, and advocates, the Department advances an inclusive, emancipatory, and participatory, vision of society situated at the intersection of UAF and UAMS's missions. This distinctive entry-level clinical doctorate in occupational therapy is consistent with the accreditation standards of the American Occupational Therapy Association.

Please direct program inquiries to otd@uark.edu or call 479-575-8727

Requirements for O.T.D. in Occupational Therapy

Admission Requirements: All prerequisites are at least 3 credits:

- Human Anatomy with lab*
- Human Physiology with lab*
- Statistics
- Terminology for Health Professions
- Abnormal Psychology
- Neuroscience of Behavior (Brain and Behavior, Behavioral or Cognitive Neuroscience, or Neurophysiology or Neuropsychology or Neurobiology, etc.)

*If Anatomy and Physiology are offered together, as one course, then two semesters must be taken.

Applicants must meet all requirements for admission to the University of Arkansas Graduate School, except the standardized test score requirement. Other admission requirements include:

- A minimum overall GPA of 3.0 on a 4.0 scale.
- International applicants must submit Test of English as a Foreign Language (TOEFL).
- 25 hours of documented volunteering, shadowing, or service learning with an occupational therapy professional in at least **three different settings**, with at least **two different populations**, e.g., children and adults. The required form for both the student and the professional can be found on the OT website (<https://hhpr.uark.edu/ot/admission-requirements.php>) as a downloadable PDF.
- Three letters of recommendation from individuals who can address the student's potential for graduate education.
- Written personal statement.
- Eligible applicants under consideration will be required to participate in an on-campus interview and an in person scholarly writing activity.

Requirements for O.T.D. in Occupational Therapy: This program is a 115-credit-hour, post-baccalaureate, 3-year (9 semesters), full-time, on-campus program with an off-campus fieldwork and capstone component.

The fieldwork experiences are integrated throughout the program to structure increasingly complex experiences. The third year of the curriculum requires a capstone experience with a culminating project.

All courses are offered one time per year for lock-step progress through the program. Students will work with their academic committee should unexpected circumstances necessitate an exception to progress through the program.

Plan of Study

First Year (January Intersession)

OCTH 5001	Introduction to an Occupational Perspective of Health and Learning	1
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First Year (Spring Semester)

OCTH 5121	The Quest for Wellness	1
OCTH 5112L	The Quest for Wellness Lab	2
OCTH 5173	The Science of Wellness	3
OCTH 5103	Theory and Foundations of Occupational Therapy	3
OCTH 5203	Professional Issues in Occupational Therapy	3
OCTH 5141	Research Fundamentals and Scholarly Practice	1
OCTH 5132	Complexity Science & Applications to Occupational Therapy	2

First Year (May Intersession)

OCTH 5212	Occupational Therapy Frameworks, Models, and Structures	2
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First Year (Summer Session)

OCTH 5221	Community Wellness	1
OCTH 5243	Evidence-based Clinical Reasoning	3
OCTH 5293	Foundations of Communication and Advocacy	3

First Year (Fall Semester)

OCTH 5361	Level I Fieldwork: Physical Conditions	1
OCTH 5351	Level I Fieldwork Seminar: Physical Conditions	1
OCTH 5372	Anatomy and Occupational Performance	2
OCTH 5371L	Anatomy and Occupational Performance Lab	1
OCTH 5311	Physical Conditions	1
OCTH 5322	Occupational Impacts of Pharmacology I: General Medical	2
OCTH 5384	Occupations, Adaptations, and Innovations: Physical Conditions	4
OCTH 5393	Introduction to Health Systems and Policy	3
OCTH 5332	Exploring Occupational Science and Occupational Therapy	2

Second Year (Spring Semester)

MGMT 5213	Business Foundations for Entrepreneurs	3
OCTH 5461	Level I Fieldwork: Neurology	1
OCTH 5451	Level I Fieldwork Seminar: Neurology	1
OCTH 5443	Research Methods in Occupational Therapy	3
OCTH 5472	Functional Neurology	2
OCTH 5472L	Functional Neurology Lab	2
OCTH 5411	Neurological Conditions	1
OCTH 5422		2
OCTH 5483		3

Second Year (May Intersessions)

OCTH 5111	Behavioral and Mental Health Conditions	1
OCTH 5581	Upper Extremity Rehabilitation	1
OCTH 5591	Occupations, Adaptations, and Innovations Upper Extremity Rehabilitation	1

Second Year (Summer Session)

OCTH 5561	Level I Fieldwork: Behavioral and Mental Health	1
OCTH 5551	Level I Fieldwork Seminar: Behavioral and Mental Health	1
OCTH 5643	Integrative Approaches to Teaching and Learning	3
OCTH 5613	Mind, Body and Environment	3
OCTH 5623	Leadership and Management	3
OCTH 5541	Integrating Creative Arts as a Modality in Practice	1

Second Year (Fall Semester)

OCTH 5666	Fieldwork IIA	6
OCTH 5651	Fieldwork IIA Seminar	1
OCTH 5683	Advanced Occupations, Adaptations and Innovations	3
OCTH 5693	Occupational Perspectives of Public Health	3
OCTH 5632	Conceptualizations of Occupational In/Justice	2

Third Year (Spring Semester)

OCTH 5781	Occupational Therapy Capstone Seminar	1
OCTH 5723	Transitions and Life Design	3
OCTH 5793	Innovations in Community Based Practice	3
OCTH 5766	Fieldwork IIB	6
OCTH 5751	Fieldwork IIB Seminar	1

Third Year (May Intersession)

OCTH 6782	Occupational Therapy Capstone Independent Study	2
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Third Year (Summer Session)

OCTH 6631	Applications of Occupational In/Justice	1
OCTH 6882	Intentional Practitioner	2

Third Year (Fall Semester)

OCTH 6966	Occupational Therapy Capstone	6
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Total Hours		115
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Graduate Faculty

Eichler, Jeanne, Ed.D. (St. Louis University), Assistant Professor, 2019.

Harris, Anna B., O.T.D. (University of Kansas), M.O.T (Rockhurst University), Clinical Assistant Professor, 2019.

Koch, Mark, O.T.D. (Saint Louis University), Clinical Assistant Professor, 2018.

Muir, Sherry, Ph.D. (Walden University), M.O.T. (Texas Women's University), Associate Professor, 2017.

Salter, Kandy S.L., O.T.H. (University of Kansas), M.S. (University of Central Arkansas), Clinical Assistant Professor, 2018.

Courses**OCTH 5001. Introduction to an Occupational Perspective of Health and Learning. 1 Hour.**

Community is integral to being, doing, becoming, and belonging . . . and to learning how to think, feel, and act like an occupational therapist. This course introduces us to ideas and evidence that guide teaching and learning in the OTD curriculum. We will begin to build a preliminary understanding of the profession's basic tenets and explore how integrative and relational theories of learning support the acquisition of our distinctive way of seeing that is how we think about and look at human doing, being, becoming, and belonging in the context of community. In the process of reflecting on our lives as thinkers, learners, and occupational beings, we will begin to recognize what kinds of learning (relational, integrative) are possible and potentially important to fostering our personal growth and our identities as occupational therapists. Prerequisite: Admission to the Occupational Therapy Doctoral Program. (Typically offered: Spring)

OCTH 5103. Theory and Foundations of Occupational Therapy. 3 Hours.

The broad theoretical basis of occupational therapy (OT) will be mapped. OT theory development, the historical foundations, major paradigm shifts, current theoretical trends, and philosophical assumptions that have developed across the profession's life span and continue to shape occupational therapy practice are explored. The emergence of occupation-based models of practice and theories that impact OT's evolving domain and process will be discussed, with emphasis on the Occupational Therapy Practice Framework: Domain and Process (OTPF). The evolving definitions of occupation and its relationship to health, well-being, and participation will be examined. Prerequisite: Admission to the Occupational Therapy Doctoral Program. (Typically offered: Spring)

OCTH 5111. Behavioral and Mental Health Conditions. 1 Hour.

Students identify etiologies, signs, symptoms, laboratory findings, diagnosis, prognosis, course of the condition, contributing factors, influence on daily life, evidence-based medical treatment, and occupational performance impacts of behavioral and mental health conditions across the lifespan. Prerequisite: OCTH 5411 and OCTH 5472. (Typically offered: Summer)

OCTH 5112L. The Quest for Wellness Lab. 2 Hours.

This highly experiential lab accompanies the Quest for Wellness Lecture course. Students will focus on the lived experience of making personal changes to improve overall wellness, including the act of asking for help and its contexts, working in partnerships and groups, evidence-based goal setting and revision, and developmental considerations of wellness across the lifespan. This course prepares students for the Community Wellness Project in the following semester. Pre- or corequisite: OCTH 5001. Corequisite: OCTH 5121. (Typically offered: Spring)

OCTH 5121. The Quest for Wellness. 1 Hour.

This course introduces students to the physical, cognitive, and emotional components of health and wellness across the life span. Students will then apply these concepts to facilitate personal wellness and professional development. Students will learn and practice multiple strategies for enhancing occupational adaptation and performance. Accompanies The Quest for Wellness Lab. Pre- or corequisite: OCTH 5001. Corequisite: OCTH 5112L. (Typically offered: Spring)

OCTH 5132. Complexity Science & Applications to Occupational Therapy. 2 Hours.

Students will define and apply principles of complexity science to occupational participation (systems theory, emergency, ways of thinking, learning and adaptation). They will describe how new ideas and perspectives can be used to meet the occupational needs of society. Diversity, co-existence of order and disorder and functioning on the edge of chaos will be discussed as well as student's personal reactions to uncertainty and uncomfortable situations. Student will begin to evaluate complex variables that relate to and impact occupational participation and their personal responses to complexity. Pre- or corequisite: OCTH 5001. (Typically offered: Spring)

OCTH 5141. Research Fundamentals and Scholarly Practice. 1 Hour.

This course introduces students to the techniques, methods and tools used in occupational science and occupational therapy research and their relationship to everyday practice. It focuses on the purposes and strengths and weaknesses of various forms of research relative to formulating a research question, conducting a literature search, assessing the quality of a source, and reporting evidence. Pre- or corequisite: OCTH 5001. (Typically offered: Spring)

OCTH 5173. The Science of Wellness. 3 Hours.

Students will investigate the physiology of wellness and begin to explore client factors, performance skills, performance patterns, contexts and environments, and responses to stress as they relate to health and wellness. This course explores the impacts between the things we see (i.e. people's habits, routines, etc. and the things we cannot see (i.e. people's body structures and functions) as they relate to the biological bases for wellness. Students will learn and practice basic principles of mindfulness. They will routinely engage in deceptively simple strategies for increasing in-the-moment awareness of thoughts, emotions, and bodily sensations in deliberate and systematic ways. By establishing regular mindfulness practices, students will enhance mind-body consciousness and achieve greater occupational presence, role satisfaction, and well-being in their daily lives. Corequisite: OCTH 5121 and OCTH 5112L. Pre- or Corequisite: OCTH 5001. (Typically offered: Spring)

OCTH 5203. Professional Issues in Occupational Therapy. 3 Hours.

This course provides a foundation for understanding professional development as students evolve into occupational therapy practitioners. Students are introduced to the roles of professional associations, legislative processes that may impact occupational therapy practice, and requirements for initial and ongoing professional registration, certification, and licensure. Students examine how occupational therapists interface with other stakeholders within a complex healthcare environment to ensure that the occupational needs of individuals and communities are met. Group process, advocacy and ethical decision making as a part of contemporary practice are also introduced. Pre- or corequisite: OCTH 5001. Corequisite: OCTH 5103. (Typically offered: Spring)

OCTH 5212. Occupational Therapy Frameworks, Models, and Structures. 2 Hours.

This course will provide an overview and synthesis of historical and contemporary perspectives that guide OT practice and why this structure is needed for best practice. Students will understand and apply fundamental concepts and language used in current OT theories and practice models. Students will apply the OT Practice Framework as a guiding document to communicate the domains and processes of OT and will complete a review of official documents from the American Occupational Therapy Association that define new knowledge and skills required for competent OT practice. Prerequisite: OCTH 5103. (Typically offered: Summer)

OCTH 5221. Community Wellness. 1 Hour.

This project-based course challenges student groups to construct a realistic, evidence-driven, occupation-centered, community-based wellness proposal that includes a basic needs assessment, occupational profile, and suggested resources for implementation. Prerequisite: OCTH 5121 and OCTH 5112L. (Typically offered: Summer)

OCTH 5243. Evidence-based Clinical Reasoning. 3 Hours.

This course will teach students to dissect and analyze occupational therapy assessments and the process of completing an evidence based, comprehensive evaluation. Students will learn and apply principals of activity analysis to occupations and formulate implications for occupational performance across the lifespan. Students will explore the different types of clinical reasoning needed for becoming a critical and self-reflective practitioner. Prerequisite: OCTH 5141. (Typically offered: Summer)

OCTH 5293. Foundations of Communication and Advocacy. 3 Hours.

This course focuses on building effective communication and professional advocacy skills with a variety of stakeholders (i.e. funding sources, service users, policymakers, etc.) regarding the profession's distinct value. Students will also practice building rapport, providing feedback, navigating conflict, utilizing therapeutic use of self, and self-advocacy skills. Students will identify personal, cultural, and environmental factors that may impact communication. Types of leadership and advocacy approaches within common populations are explored, while strategies for communication with multiple populations are identified and practiced. Pre- or corequisite: OCTH 5203. (Typically offered: Summer)

OCTH 5311. Physical Conditions. 1 Hour.

This course will explore the etiologies, signs, symptoms, laboratory findings, diagnosis, prognosis, course of the condition, contributing factors, usual medical treatment of common physical disorders that impact occupational functioning across the lifespan. Prerequisite: OCTH 5173. Corequisite: OCTH 5372 and OCTH 5371L. (Typically offered: Fall)

OCTH 5322. Occupational Impacts of Pharmacology I: General Medical. 2 Hours.

This course focuses on pharmacological interventions to common physical diseases and conditions that impact occupational functioning across the lifespan. Students will learn about frequently prescribed medications, their indications and side effects. Prerequisite: OCTH 5173. Corequisite: OCTH 5371L and OCTH 5311. (Typically offered: Fall)

OCTH 5332. Exploring Occupational Science and Occupational Therapy. 2 Hours.

Occupational Science is the study of humans as occupational beings. This course introduces students to the origin and evolution of occupational science and its relationship to occupational therapy. Students will examine human health and adaptation through an occupational science-oriented lens, applying their emerging critical occupational perspective of health to the determinants of occupational participation and well-being. Prerequisite: OCTH 5293. (Typically offered: Fall)

OCTH 5351. Level I Fieldwork Seminar: Physical Conditions. 1 Hour.

This fieldwork seminar emphasizes beginning clinical reasoning skills and professional documentation (specifically of basic physical assessments) using classroom analysis of observations made during the Level I Fieldwork I experience, with an emphasis on professional behaviors, communication, ethics, interdisciplinary roles, models of practice, and factors that influence engagement in occupation. Prerequisite: Successful completion of all previous skill-based competency exams, and departmental consent. Corequisite: OCTH 5361. (Typically offered: Fall)

OCTH 5361. Level I Fieldwork: Physical Conditions. 1 Hour.

Students will engage in direct observation and competency-based practice at clinical fieldwork sites to enhance professional behaviors, observation and activity analysis skills. Students will adequately perform basic assessment techniques such as an occupational profile, taking vitals, completing range of motion and manual muscle testing. Students will recognize the influence of social and environmental factors on an individual's and group's participation in occupations. Students will be expected to integrate knowledge, experience, and evidence while developing clinical reasoning skills. Prerequisite: Successful completion of all previous skill based competency exams and departmental consent. Corequisite: OCTH 5351. (Typically offered: Fall)

OCTH 5371L. Anatomy and Occupational Performance Lab. 1 Hour.

Using a multi-media approach, students will review body structures and functions and apply the principles of kinesiology while measuring variables that impact movement and performance across the lifespan. Concepts will be applied in co-occurring courses. Prerequisite: OCTH 5173. Corequisite: OCTH 5372. (Typically offered: Fall)

OCTH 5372. Anatomy and Occupational Performance. 2 Hours.

This course focuses on the human musculoskeletal system and its impact on physical performance in relation to participation in occupations across the lifespan. Students will review body structures and apply principles of kinesiology that impact movement across the lifespan. Human Anatomy and Performance Lab accompanies this course. Prerequisite: OCTH 5173. Corequisite: OCTH 5371L. (Typically offered: Fall)

OCTH 5384. Occupations, Adaptations, and Innovations: Physical Conditions. 4 Hours.

This course focuses on occupation centered adaptations and interventions for physical conditions. Adaptive solutions to occupational performance issues are explored and applied to authentic environments. Problem based learning incorporating previously covered material will be utilized to facilitate innovation and client-centered solutions. Prerequisite: OCTH 5173. Corequisite: OCTH 5372 and OCTH 5371L. (Typically offered: Fall)

OCTH 5393. Introduction to Health Systems and Policy. 3 Hours.

This course explores how policy and service delivery systems impact individual and population health and well-being. Factors influencing the scope and practice of occupational therapy, such as legislation, regulation, and reimbursement schemes/criteria are explored. The influence of health care trends on service delivery are examined. Prerequisite: OCTH 5132. (Typically offered: Fall)

OCTH 5411. Neurological Conditions. 1 Hour.

Students identify etiologies, signs, symptoms, laboratory findings, diagnosis, prognosis, course of the condition, contributing factors, the influence on daily life, evidence-based medical treatment, and typical occupational performance impacts of neurologic conditions across the lifespan. Prerequisite: OCTH 5311. (Typically offered: Spring)

OCTH 5421. Occupational Impacts of Pharmacology II: Neurology and Mental Health. 1 Hour.

This course focuses on pharmacological interventions to common neurological diseases and conditions that impact occupational functioning across the lifespan. Students will learn about frequently prescribed medications, their indications and side effects. Prerequisite: OCTH 5322. Corequisite: OCTH 5472, OCTH 5472L and OCTH 5411. (Typically offered: Spring)

OCTH 5443. Research Methods in Occupational Therapy. 3 Hours.

This course provides students with the opportunity to apply techniques, methods, and tools used for research in occupational science and occupational therapy. Students will deepen their understanding of the research process and scientific method, specific study designs, methods for data collection, and analysis. Prerequisite: OCTH 5243. (Typically offered: Spring)

OCTH 5451. Level I Fieldwork Seminar: Neurology. 1 Hour.

This fieldwork seminar emphasizes intermediate observation, clinical reasoning skills and professional documentation through class discussion of observations made during the Level 1 Fieldwork: Neurology experience. This course incorporates a new emphasis on interdisciplinary roles, community, cultural, and policy factors that influence engagement in occupation. Prerequisite: Successful completion of all previous skill-based competency exams and department consent. Corequisite: OCTH 5461. (Typically offered: Spring)

OCTH 5461. Level I Fieldwork: Neurology. 1 Hour.

Students participate in directed observation and competency-based participation at clinical fieldwork sites to apply knowledge related to assessment and intervention of neurological conditions. Students will observe a practitioner and dialogue with them about their process. Special attention given to the influence social, environmental, and psychological factors have on an individual's or group's participation in occupations. Students will be expected to integrate knowledge, experience, and evidence while applying learning to a variety of consumers. Prerequisite: Successful completion of all previous skill-based competency exams and department consent. Corequisite: OCTH 5451. (Typically offered: Spring)

OCTH 5472. Functional Neurology. 2 Hours.

This course will focus on the neurological basis for occupational performance. Students will examine physical and cognitive processes related to the brain and neural pathways. Targeted assessments for specific neurological functions and conditions will be examined. This course will accompany OCTH 5472L Functional Neurology Lab. Prerequisite: OCTH 5372. Corequisite: OCTH 5472L. (Typically offered: Spring)

OCTH 5472L. Functional Neurology Lab. 2 Hours.

This course will focus on the assessment tools used as the neurological basis for functional activity and occupational performance. Students will learn how to evaluate standardized and non-standardized assessments for overall quality, determine the most appropriate assessments for specific functions, administer, and interpret data collected in a neurological evaluation. Prerequisite: OCTH 5372. Corequisite: OCTH 5472. (Typically offered: Spring)

OCTH 5484. Occupations, Adaptations, and Innovations: Neurological Conditions. 4 Hours.

This course focuses on occupation centered adaptations and interventions for neurologic conditions. Adaptive solutions to occupational performance issues are explored and applied to authentic environments. Problem based learning incorporating previously covered material will be utilized to facilitate innovation and client-centered solutions. Prerequisite: OCTH 5384. Corequisite: OCTH 5472, OCTH 5472L, and OCTH 5411. (Typically offered: Spring)

OCTH 5541. Integrating Creative Arts as a Modality in Practice. 1 Hour.

This course explores traditional and non-traditional applications of creative arts in practice. Students will be encouraged to employ therapeutic use of self to identify how they might use their interests, traditions and talents in their own practices. Etiquette regarding terminology that references established creative arts therapy fields; an overview of the degree and skill requirements for those fields will be discussed. Students will access and discuss literature in peer reviewed creative arts journals to identify similarities and differences in scope of practice, gain new ideas, and identify potential collaborative partners in practice and research. Prerequisite: OCTH 5332 and OCTH 5443. (Typically offered: Summer)

OCTH 5551. Level I Fieldwork Seminar: Behavioral and Mental Health. 1 Hour.

This fieldwork seminar emphasizes application of clinical reasoning skills and professional documentation (specifically of basic behavioral and mental health conditions) using classroom analysis of observations made during the Level I Fieldwork I experience, with an emphasis on professional behaviors, communication, ethics, interdisciplinary roles, models of practice, and factors that influence engagement in occupation. Prerequisite: Successful completion of all previous skill based competency exams and department consent. Corequisite: OCTH 5561. (Typically offered: Summer)

OCTH 5561. Level I Fieldwork: Behavioral and Mental Health. 1 Hour.

Students participate in directed observation and competency-based participation at clinical fieldwork sites to apply knowledge related to assessment and intervention of behavioral and mental health conditions. Students will observe a practitioner and dialogue with them about their process. Special attention given to the influence social, environmental, and psychological factors have on an individual's or group's participation in occupations. Students will be expected to integrate knowledge, experience, and evidence while applying learning to a variety of consumers. Prerequisite: Successful completion of all previous skill based competency exams and department consent. Corequisite: OCTH 5551. (Typically offered: Summer)

OCTH 5581. Upper Extremity Rehabilitation. 1 Hour.

This course focuses on the evaluation and interventions of upper extremity dysfunction from an occupational perspective. Students will learn about nerve and muscular/orthopedic issues of the upper extremity with an emphasis on the wrist and hand. Interventions to promote occupational performance are discussed. Prerequisite: OCTH 5372 and OCTH 5472. Corequisite: OCTH 5591. (Typically offered: Summer)

OCTH 5591. Occupations, Adaptations, and Innovations Upper Extremity Rehabilitation. 1 Hour.

This course focuses on the evaluation and treatment of upper extremity dysfunction, with emphasis on the wrist and hand, from an occupational perspective. Students will administer and interpret common upper extremity evaluations, develop occupation centered interventions and fabricate orthotics to promote occupational performance. This lab course accompanies OCTH 5581 Upper Extremity Rehabilitation Lecture. Prerequisite: OCTH 5384 and OCTH 5483. Corequisite: OCTH 5581. (Typically offered: Summer)

OCTH 5613. Mind, Body and Environment. 3 Hours.

This course will introduce occupation-based interventions to address the psychosocial and behavioral health conditions that impact occupational performance, focusing on the impact that environmental, developmental and personal contexts have on mental health with regard to participation and recovery. Students incorporate knowledge about human development and function across diagnosis and ages to develop individual, group, and population-based interventions. Prerequisite: OCTH 5111. (Typically offered: Summer)

OCTH 5623. Leadership and Management. 3 Hours.

This course will explore leadership theories and management approaches. Students will apply principles of leadership and management to strategic plan development, continuous quality improvement, program evaluation, and ethical service delivery. Prerequisite: OCTH 5132 and OCTH 5393. (Typically offered: Summer)

OCTH 5632. Conceptualizations of Occupational In/Justice. 2 Hours.

This course will examine the conceptual development of occupational in/justice and explore the various forms of occupational injustices encountered in everyday OT practice. Students will analyze and critique occupational in/justice-related concepts and themes and apply their emerging occupational justice perspective of health to critically address injustices encountered in clinical experiences and everyday practice. Prerequisite: OCTH 5332. (Typically offered: Fall)

OCTH 5643. Integrative Approaches to Teaching and Learning. 3 Hours.

The learning process and role of teacher/facilitator are explored. Evidence based learning theories and their applications across occupational therapy domains are examined. Students will apply instructional design principles to educate stakeholders and promote the profession of occupational therapy. Prerequisite: OCTH 5443. (Typically offered: Summer)

OCTH 5651. Fieldwork IIA Seminar. 1 Hour.

This course includes discussion and reflection focused on fieldwork experiences, including a critical examination of service provision and populations served. Students will document achievement and self-evaluation throughout the fieldwork experience. Prerequisite: Successful completion of all previous coursework, skill based competencies, and department consent. Corequisite: OCTH 5666. (Typically offered: Fall and Summer)

OCTH 5666. Fieldwork IIA. 6 Hours.

Students participate in supervised clinical placements to demonstrate competencies required for entry-level general occupational therapy practice. Students are expected to employ professional behaviors and clinical reasoning consistent with general entry-level practice. Students will complete occupational therapy evaluations, interventions, and discharge planning that is considerate of consumer and community resources, institutional policies, reimbursement systems, and roles of interdisciplinary team members throughout the process. Critical examination of service provision and populations served will be expected. Prerequisite: Successful completion of all previous coursework, skill based competencies, and department consent. Corequisite: OCTH 5651. (Typically offered: Fall, Spring and Summer)

OCTH 5683. Advanced Occupations, Adaptations and Innovations. 3 Hours.

Students will explore a variety of mid-to-high tech adaptations designed to facilitate occupational participation. Collaboration with other disciplines to develop innovative adaptive solutions is discussed. The decision-making process used in making recommendations for high tech adaptation is analyzed. Individual and contextual variables that impact access to and use of mid-to-high tech adaptations are considered. Students will develop innovative, client centered solutions to improve occupational performance and quality of life. Students will explore potential partnerships with organizations that provide resources and advocacy to enhance occupational performance through technology. Prerequisite: OCTH 5384 and OCTH 5483. (Typically offered: Fall)

OCTH 5693. Occupational Perspectives of Public Health. 3 Hours.

This course will apply an occupational perspective to public health initiatives at local, state, federal, and global levels. Public health laws and ethics will be analyzed along with strategies used to design and evaluate community based public health programs in conjunction with service learning. Prerequisite: OCTH 5393 and OCTH 5623. (Typically offered: Fall)

OCTH 5723. Transitions and Life Design. 3 Hours.

This course focuses on the impact transitions have on habits, routines, role/ identities, and meaning-making. Students will explore un/planned life transitions and their implications for health and wellness across the lifespan. Students examine theories/processes of transition from multiple disciplinary perspectives, transition planning strategies, and the potential role of occupational therapists as transition specialists. Prerequisite: OCTH 5666 and OCTH 5651. (Typically offered: Spring)

OCTH 5751. Fieldwork IIB Seminar. 1 Hour.

This course includes discussion and reflection focused on fieldwork experiences, including a critical examination of service provision and populations served. Students will document achievement and self-evaluation throughout the Fieldwork experience. Prerequisite: Successful completion of all previous coursework, skill based competencies, and department consent. Corequisite: OCTH 5766. (Typically offered: Spring)

OCTH 5766. Fieldwork IIB. 6 Hours.

Students participate in supervised clinical placements to demonstrate competencies required for entry-level general occupational therapy practice. Students are expected to employ professional behaviors and clinical reasoning consistent with general entry-level practice. Students will complete occupational therapy evaluations, interventions, and discharge planning that is considerate of consumer and community resources, institutional policies, reimbursement systems, and roles of interdisciplinary team members throughout the process. Critical examination of service provision and populations served will be expected. Prerequisite: Successful completion of all previous coursework, skill based competencies, and department consent. Corequisite: OCTH 5751. (Typically offered: Spring)

OCTH 5781. Occupational Therapy Capstone Seminar. 1 Hour.

This seminar provides students with an in-depth understanding of expectations, timelines and responsibilities as they prepare for OCTH 6966 Occupational Capstone. Students are expected to identify and initiate work with a Capstone mentor and outline a proposal for the Capstone experience and project. Prerequisite: OCTH 5666. (Typically offered: Spring)

OCTH 5793. Innovations in Community Based Practice. 3 Hours.

This course prepares the innovative future occupational therapist to envision possibilities for clinical work outside of traditional education or medical service delivery models. Students will apply an occupational justice perspective of health as they create a novel initiative that supports occupational participation. Prerequisite: OCTH 5683 and OCTH 5632. (Typically offered: Spring)

OCTH 6631. Applications of Occupational In/Justice. 1 Hour.

Students will deepen and sharpen their critical occupational perspective of health and well-being by applying occupational in/justice-related concepts to address and confront occupational injustices. Prerequisite: OCTH 5632. (Typically offered: Summer)

OCTH 6782. Occupational Therapy Capstone Independent Study. 2 Hours.

Students will complete a formal needs assessment and literature review in preparation for the Capstone project and experience. Students will collaborate with established Capstone mentors throughout this process. Prerequisite: OCTH 5781. (Typically offered: Summer)

OCTH 6882. Intentional Practitioner. 2 Hours.

This course will facilitate student synthesis learning throughout the OTD program in preparation to transition from student to professional. Students will engage in complex problem-solving tasks and reflections intended to foster mindful habits, routines and rituals to guide personal, professional, and ethical decision making. Prerequisite: OCTH 5766 and OCTH 5751. (Typically offered: Summer)

OCTH 6966. Occupational Therapy Capstone. 6 Hours.

The Occupational Therapy Capstone experience and project provides students with an in-depth exposure to clinical practice, research, administration, leadership, policy, and/or program development. Students are expected to collaborate with a mentor to design learning and performance objectives prior to initiating onsite experiences. The experience concludes with a culminating project reflecting the student's integration of occupation centered knowledge and skills and ability to engage in critical and self-reflective inquiry. Prerequisite: Successful completion of all previous coursework, skill based competency exams, and department consent. (Typically offered: Fall)

Operations Analytics (OPAN)

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Degree Conferred:

M.S. in Operations Analytics (OPAN)

Program Description: The Department of Industrial Engineering offers a graduate program leading to the Master of Science in Operations Analytics (M.S.) for engineering, science, and other non-engineering graduates. The Master of Science in Operations Analytics is an intensive program that will guide students through the theory and practice of the quantitative modeling of enterprise operations via descriptive, predictive, and prescriptive analytics. Students will develop knowledge of the principles and practices of analytics modeling methods, such as optimization, statistical modeling, machine learning, simulation, and computing methods, as they apply to the strategic, operational, and tactical control of operations.

Requirements for M.S. in Operations Analytics

Prerequisites to the M.S.O.A. Degree Program:

1. There are no prerequisites for students with an undergraduate degree from an ABET-accredited industrial engineering program.
2. For students with a degree other than an ABET-accredited industrial engineering degree, a number of prerequisite courses may be required. Students are expected to have completed mathematics

courses through differential and integral calculus of several variables and vector calculus and linear algebra. Students are expected to have completed a calculus-based probability and statistics course. In addition, students are expected to have completed a computer programming course. Specific University of Arkansas courses that meet these prerequisites are available on-line through the INEG departmental web-pages.

Requirements for the Master of Science in Operations Analytics

In addition to the requirements of the Graduate School and the College of Engineering, the following program requirements must be satisfied by candidates for the M.S.O.A. degree.

1. Candidates for the degree are required to complete 30 semester hours of course work.
2. All candidates must successfully complete a master's oral examination that is conducted by the candidate's faculty committee.

Accelerated Master of Science in Operations Analytics

High-achieving current undergraduate students seeking a BS degree at the University of Arkansas who choose to pursue graduate studies in Operations Analytics may participate in the accelerated M.S.O.A. program. Provided that 6 credit hours of 5000-level OPAN course work can be taken as electives in the student's current undergraduate program, students may also count those 6 hours towards their M.S.O.A. degree. In addition, students may take another 6 credit hours of graduate degree credit as undergraduate students in order to apply them to their M.S.O.A. degree. These additional 6 hours of courses may not have been used towards the B.S. undergraduate degree and must meet M.S.O.A. degree requirements. The total of 12 credit hours of graduate courses taken as an undergraduate student must be taken during the final 12 month period of their undergraduate degree.

Once fully admitted to the M.S.O.A. program, students request that up to 12e hours of 5000-level or above courses taken in the final 12-month period of their undergraduate degree count toward their graduate degree, if these courses were taken on the University of Arkansas, Fayetteville campus. Students then take an additional 18 credit hours of approved OPAN graduate-level courses in order to meet the M.S.O.A. degree requirements.

Undergraduate students interested in the accelerated M.S.O.A. degree should apply to the program prior to starting the second-to-last semester of their undergraduate program. To be eligible students must have a 3.5 cumulative GPA or higher and submit the normal application materials required by the graduate school for the M.S.O.A. degree program. For students eligible for the accelerated M.S.O.A. program that have a cumulative GPA of 3.5 or higher, the submission of GRE scores is waived.

Required Courses

OPAN 5003	Introduction to Operations Analytics	3
OPAN 5013	Applied Predictive Analytics	3
OPAN 5023	Applied Prescriptive Analytics	3
OPAN 5903	Operations Analytics Capstone	3
	or OPAN 5913 Operations Analytics Industrial Practicum	

Electives 18

Students must select course electives from both of the following course topic areas for a total of 18 credit hours.

Operations Analytics (choose 4 or 5 courses)

INEG 5163	Introduction to Modern Statistical Techniques for Industrial Applications
INEG 5313	Engineering Applications of Probability Theory
INEG 5323	Engineering Applications of Stochastic Processes
INEG 5443	Decision Models
INEG 5833	Introduction to Database Concepts for Industrial Engineers
INEG 5683	Nonlinear Programming
INEG 5693	Heuristic Optimization
OPAN 5713	Simulation Analytics
Engineering and Operations Management (choose 1 or 2 courses)	
EMGT 5033	Introduction to Engineering Management
EMGT 5053	Tradeoff Analytics for Engineering Management
EMGT 5603	Systems Thinking and Systems Engineering
OMGT 5013	Supply Chain Management for Operations Managers
OMGT 5373	Quality Management
OMGT 5783	Project Management for Operations Managers
OMGT 5983	Advanced Project Management
INEG 5263	Engineering Statistics
INEG 5333	Design of Industrial Experiments
INEG 5423	Advanced Engineering Economy
INEG 5623	Analysis of Inventory Systems
INEG 5803	Simulation

Courses

OPAN 5003. Introduction to Operations Analytics. 3 Hours.

An introduction to operations analytics providing an understanding of the role of analytics within operational settings. Builds basic skill instruction in descriptive analytics and the communication of analytics. An overview of introductory techniques within the field of analytics and their application. (Typically offered: Fall, Spring and Summer)

OPAN 5013. Applied Predictive Analytics. 3 Hours.

This course focuses on the fundamental theory, methodologies, algorithms and software tools for predictive analytics. The main goal is to equip the students with the basic knowledge and skills to solve common predictive analytics problems arising from various applications. Methodologies covered in this course include linear and non-linear regression, additive models, ensemble trees, model assessment and selection, Artificial Neural Network. Students will learn how to implement the methods using popular statistical computing and analytics tools. Working knowledge of multi-variate calculus based probability and statistical inference is expected. Prerequisite: OPAN 5003. (Typically offered: Fall, Spring and Summer)

OPAN 5023. Applied Prescriptive Analytics. 3 Hours.

Methods, algorithms, and techniques for optimization models used in analytics applications. Coverage includes model formulation, solution methods and the use of optimization software. Prerequisite: OPAN 5003. (Typically offered: Fall, Spring and Summer)

OPAN 5713. Simulation Analytics. 3 Hours.

An overview of Monte Carlo computer simulation methods and their application within analytics. Generation of random variates from univariate and multi-variate distributions. Probability model representation and fitting methods. Computing methods for simulating and estimating random processes. Bootstrapping procedures. Statistical reasoning and decision making under uncertainty. Working knowledge of calculus-based probability and statistics and computer programming is expected. (Typically offered: Fall and Summer)

OPAN 5903. Operations Analytics Capstone. 3 Hours.

Comprehensive analytics project. Conduct background research, data collection, and preliminary analysis; define objectives, performance measures, and deliverables; apply analytics methods, develop recommended solutions, and document solution and benefits. Course should be taken in the term prior to meeting degree requirements. Students cannot receive credit for both OPAN 5903 and OPAN 5913. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

OPAN 5913. Operations Analytics Industrial Practicum. 3 Hours.

Student must apply to enroll in this course. Students must be employed within an analytics organization in industry. Prior approval to use an organization's analytics project as the basis of the student's course project must be obtained. A project report documenting the application of analytics performed by the student within the organization is required. An evaluation by the student's supervisor on the technical aspects of the student's work will be required in addition to an evaluation by the course instructor. The student's supervisor must be an analytics professional. Course should be taken in the term prior to meeting degree requirements. Students cannot receive credit for both OPAN 5903 and OPAN 5913. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

Operations Management (OPMG)

Also offered through Graduate Resident Centers

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Operations Management Program website (<http://operations-management.uark.edu/>)

Degree Conferred:

M.S.O.M. (OPMG)

Graduate Certificates Offered (non-degree):

Homeland Security (OMHS)
Lean Six Sigma (OMLS)
Project Management (OMPM)

Program Description: The Operations Management program, part of the Department of Industrial Engineering, teaches the processes for improving operational decisions such as design of goods and services, management of quality, consideration of process and capacity design issues, and determination of location and layout strategy.

Master of Science in Operations Management

The Master of Science program in Operations Management is directed toward the acquisition of practical knowledge in the management of work processes, projects, and people. Areas covered include project management, quality management, economic decision-making, supply chain management, operations research, safety management, lean production and inventory control techniques, and human behavior analysis.

The operations management program is conducted at Graduate Residence Centers in Arkansas, Tennessee, and Florida, as well as at Fayetteville. Evening classes are offered in eight-week terms with five terms scheduled during an academic year. Selected courses are available online and via independent study. The operations management curriculum is aimed at the needs of working managers of technical and logistics operations, as well as managers of production, service

delivery and support functions in a wide spectrum of organizations, ranging from business/industry to military, government and non-profit. The program is open to students regardless of the major they selected as an undergraduate. The subject matter is patterned after the industrial engineering curriculum but is less technical and does not require a calculus mathematics background.

Admission

Admission to the program generally follows U of A Graduate School admission policies with the following exceptions:

1. The program does not permit the use of the MAT as an entrance test to compensate for undergraduate GPAs below 3.0. The GRE and GMAT are acceptable tests, but the analytical writing score must be 4.5 or above;
2. All applicants, including those with advanced degrees, will be evaluated for admission on the basis of their first baccalaureate degree.
3. OMGT 5003 must be taken in the first term of operations management graduate study.
4. Before taking any graduate classes in the program, non-native speakers of English who do not have a conferred undergraduate degree from an accredited U.S. college or university must demonstrate minimum proficiency on one of the following tests of written English: TOEFL, IBT (26), ELPT (75) or GRE/GMAT Analytical Writing (4.5). The MSOM English Language Proficiency Policy requires Level II non-native speakers of English to complete ELAC 4043 Research Writing in the STEM fields no later than the first semester of graduate level courses. In addition to course pre-requisites, before completing 12 hours of course work toward the operations management degree, students must successfully complete the following courses (or equivalent courses or demonstrate knowledge of these subject areas acceptable to the program):

OMGT 4313	Law and Ethics	3
OMGT 4323	Industrial Cost Analysis	3
OMGT 4333	Applied Statistics	3
OMGT 4853	Introduction to Decision Support Tools in Operations Management	3

These courses are offered at the undergraduate level and cannot be applied toward the requirements for a Master of Science in Operations Management degree.

Requirements for the M.S.O.M. Degree

To fulfill requirements for the M.S.O.M. degree, a student must earn a total of 30 semester hours credit in the program. Of these hours, 12 hours consist of required courses, while the remaining 18 hours are electives.

Required courses are:

OMGT 5003	Introduction to Operations Management	3
OMGT 5783	Project Management for Operations Managers	3
OMGT 5623	Strategic Management	3
OMGT 5123	Finance for Operations Managers	3
	or OMGT 5463 Economic Decision Making	

If a core course requirement offers a choice between two options, only one can be counted as the required course. Required courses must be taken in the first 18 hours of graduate coursework and be completed with

a grade of "B" or better. Students who earn a "C" or lower in a required course may repeat the course only once. Failure to earn a "B" or better in any of the four required courses will result in dismissal from the program.

A minimum grade-point average of 3.0 (A = 4.0), calculated from the University of Arkansas graduate courses in this curriculum, must be met as a graduation requirement. Please note that if a student must retake a class to meet the grade requirements of this program, both the original grade and the retaken grade will count in the calculation of the GPA for graduation purposes.

While a thesis is not required, upon approval of the program director students may take up to six thesis hours to be applied toward the 30 semester hours required for degree completion. The six hours of thesis must be completed on the Fayetteville campus.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Graduate Certificate in Homeland Security

Program admission requires 3.0 GPA on the last 60 hours of undergraduate coursework. Students must complete coursework with at least a 3.0 GPA. Four courses totaling 12 credit hours must be completed. The following courses are required core courses:

OMGT 5003	Introduction to Operations Management	3
OMGT 5013	Supply Chain Management for Operations Managers	3
OMGT 5993	Homeland Security for Operations Managers	3
Complete one of the following:		3
OMGT 5373	Quality Management	
OMGT 5423	Operations Management & Global Competition	
OMGT 5623	Strategic Management	
OMGT 5733	Human Behavior Analysis	
OMGT 5793	Risk Management	
OMGT 5823	Information Technology for Operations Managers	
OMGT 5903	Operations Management of Unmanned Aircraft Systems	
Total Hours		12

Graduate Certificate in Lean Six Sigma

Requirements for the Graduate Certificate in Lean Six Sigma:

Program admission requires 3.0 GPA on the last 60 hours of undergraduate coursework. Students must complete the following 12 hours of coursework with at least a 3.0 GPA.

Required Courses

OMGT 5373	Quality Management	3
OMGT 5473	Lean Six Sigma	3
OMGT 5493	Advanced Lean Six Sigma	3
OMGT 5783	Project Management for Operations Managers	3
Total Hours		12

Graduate Certificate in Project Management

Admission to the Graduate Certificate program generally follows U of A Graduate School admission policies with the following exceptions:

1. All applicants, including those with advanced degrees, will be evaluated for admission on the basis of their first baccalaureate degree.

- Students may be eligible for admission by special consideration if the GPA is below 3.0 but above 2.5.
- Before taking any graduate classes in the program, non-native speakers of English who do not have a conferred undergraduate degree from an accredited U.S. college or university must demonstrate minimum proficiency on one of the following tests of written English: TOEFL, IBT (26), ELPT (75) or GRE/GMAT Analytical Writing (4.5). The English Language Proficiency Policy for the Master of Science in Operations Management requires Level II non-native speakers of English to complete ELAC 4043 Research Writing in the STEM Fields no later than the first semester of graduate level courses.

Former students or alumni of the Master of Science in Operations Management program may use six credit hours (two courses) from the M.S.O.M. program toward equivalent Project Management Certificate courses. If an alumnus has completed all possible combination of courses for the Project Management Certificate, the student may petition to take one additional course chosen by the program to complete the Project Management Graduate Certificate.

Current M.S.O.M. students who are concurrently accepted into the Project Management Certificate program may use all applicable courses for both the M.S.O.M. degree and the Project Management Certificate.

Requirements for Graduate Certificate in Project Management

Required Courses

OMGT 5253	Leadership Principles and Practices	3
OMGT 5783	Project Management for Operations Managers	3
OMGT 5983	Advanced Project Management	3
Choose one elective:		3
OMGT 5373	Quality Management	
OMGT 5433	Cost Estimation Models	
OMGT 5463	Economic Decision Making	
OMGT 5873	Organizing for Change	
Total Hours		12

Graduate Faculty Courses

OMGT 5003. Introduction to Operations Management. 3 Hours.

Provides an overview of the functional activities necessary for the creation/delivery of goods and services. Topics covered include: productivity; strategy in a global business environment; project management; quality management; location and layout strategies; human resources management; supply chain and inventory management; material requirements planning; JIT; maintenance and reliability; and other subjects relevant to the field. Required course. Pre- or Corequisite: OMGT 4853. Prerequisite: OMGT 4333, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. MSE or MSEM students may take the course with advisor consent. (Typically offered: Fall and Spring)

OMGT 5013. Supply Chain Management for Operations Managers. 3 Hours.

Focuses on the development and application of decision models in supply chains with emphasis on supply chain performance, cost, and metrics; demand forecasting; aggregate planning; inventory management; supply chain design and distribution; transportation modeling and analysis; supply chain coordination; the role of information technology; and sourcing decisions. Spreadsheet tools and techniques will be used to analyze supply chain performance. Prerequisite: OMGT 4333, OMGT 4853 and admitted to OPMGMS, EMGTMS, ENGRME or OMPMGC Graduate Certificate Program, or departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5113. Human Resource Management. 3 Hours.

A review of Human Resources Management functions as they apply in today's business setting with specific emphasis on regulatory compliance, total rewards systems, recruitment, training, and employment practices. The course is designed both for HRM professionals and for line managers/professionals who need to understand the roles and responsibilities of HR as a business partner. Prerequisite: OMGT 4313, OMGT 5003 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5123. Finance for Operations Managers. 3 Hours.

Examines the scope and environment of finance for operations managers. Topics include financial markets, interest rates, financial statements, cash flows, and performance evaluation. Valuation of financial assets, using time value of money; the meaning and measurement of risk/return; capital-budgeting, cost of capital, capital structure, dividend policy, and working capital management are also covered. Required course (may substitute OMGT 5463). Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4323, OMGT 4853 and admitted to OPMGMS, EMGTMS, ENGRME, or OMPMGC Graduate Certificate Program, or departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5133. Operations Management in the Service Sector. 3 Hours.

Review of the role of the operations management in the service sector, e.g., health care systems, banking, municipal services, utilities, and postal service and others. Emphasizes the principles and methodologies applicable to the solution of problems within the service industries. Pre- or Corequisite: OMGT 5003. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5143. Strategic Issues in Human Resource Management. 3 Hours.

Explores the concept of Strategic Human Resource Management with emphasis on effective partnering by various HR functions with all levels of management to support the large-scale, long-range goals of achieving success in the organization's chosen markets. Internal and external impacts on and of HR in all areas will be examined. Students will analyze case studies to build on basic concepts acquired in OMGT 5113. Prerequisite: OMGT 5003, OMGT 4313, OMGT 5113 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5253. Leadership Principles and Practices. 3 Hours.

The course is designed to expose students to multiple approaches to leadership in a wide variety of settings. Leadership styles, the knowledge areas and competencies expected of today's leaders, the challenges leaders face, the historical and philosophical foundations of leadership, the relationships among leadership theory, leadership practice, and the moral-ethical aspects of leadership are among the topics covered in the course. A number of respected regional, national, and international leaders share 'lessons learned' in their leadership journeys. Plus, a number of highly regarded leadership books and case studies on leadership are read and discussed. Students may not receive credit for INEG 4253 and INEG 5253/OMGT 5253. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer)

This course is cross-listed with INEG 5253.

OMGT 5303. Health Care Policies and Issues. 3 Hours.

Explores health care management strategies and policy development with emphasis on health insurance, Medicare, Medicaid and managed care, as well as employee health benefits. The roles of government and business in policy formulation are addressed, as are the problems of financing health care, legal and ethical considerations, current healthcare issues, and quality measures. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5373. Quality Management. 3 Hours.

Introduces students to quality management concepts and their use in enhancing organizational performance and profitability. History of the quality movement, its broad application in key economic sectors, and philosophical perspectives of major quality leaders will be discussed. Focus is on continuous process improvement, using data and information to guide organizational decision-making. The Six Sigma approach and associated statistical tools, supporting process improvement, are also covered. Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4333 and OMGT 4853, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5403. Industrial Safety and Health Administration. 3 Hours.

Based on Federal Regulations for Occupational Safety and Health, the course examines current regulations, as well as their commonsense application. Covers various standards, such as those for material handling, personal protective equipment, toxic substances, and machine guarding. Uses case studies and real world scenarios to present topics and demonstrate their application. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5423. Operations Management & Global Competition. 3 Hours.

Studies of principles and cases in business/industrial administration in global competition. Survey of markets, technologies, multi-national corporations, cultures, and customs. Discussion of ethics, professionalism, difference valuing, human relations skills, and other topics relevant to global practice. Pre-or Corequisite: OMGT 5003. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Spring)

OMGT 5433. Cost Estimation Models. 3 Hours.

Overview of cost estimation techniques and methodologies applied to manufacturing and service organizations. Accomplished through detailed analysis of the cost estimation development process and various cost estimation models. Topics include data collection and management, learning curves, activity based costing, detailed and parametric estimation models, and handling risk and uncertainty. Prerequisite: OMGT 4853 and OMGT 4333, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

This course is cross-listed with INEG 5433.

OMGT 5443. Decision Models. 3 Hours.

Focus on quantitative decision models for technical and managerial problems for private and public organizations. Topics include shareholder value, stakeholder value, Value-Focused Thinking, axioms of decision analysis, decision making challenges, decision traps, cognitive biases, decision processes, decision framing, influence diagrams, value hierarchy structuring, designing creative alternatives, single objective models, multiobjective additive value model, swing weights, sensitivity analysis, portfolio decision models with binary linear programming, probability elicitation, Bayes Theorem, decision trees, Monte Carlo simulation, expected value, dominance (deterministic and stochastic), tornado diagrams, value of information, risk preference, utility models, expected utility, and communicating analysis insights. Prerequisite: (OMGT 5003, OMGT 4333, and OMGT 4853) or INEG 2313, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

This course is cross-listed with INEG 5443.

OMGT 5463. Economic Decision Making. 3 Hours.

Principles of economic analysis with emphasis upon discounted cash flow criteria for decision-making. Comparison of criteria such as rate of return, annual cost, and present worth for the evaluation of investment alternatives. Required course (may be substituted by OMGT 5123). Prerequisite: OMGT 5003, OMGT 4323 and OMGT 4853, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5473. Lean Six Sigma. 3 Hours.

This course covers the application of lean principles to manufacturing, service and government processes in order to improve productivity, increase value and eliminate waste as well as the use of the Six Sigma problem solving methodology to reduce variation and improve quality. Students will gain experience with the tools and analysis methods used in both approaches. The topics covered include: methods for creating Lean processes, proven lean problem-solving methodologies, managing a lean transformation, implementing a Six Sigma initiative, and executing the five phases of the Six Sigma DMAIC process, and communicating results to stakeholders and decision-makers. Prerequisite: (OMGT 5003 or departmental consent), and admitted to the (Master of Science in Operations Management Program, or the Project Management Graduate Certificate Program, or be a non-degree seeking graduate student with departmental consent). (Typically offered: Fall, Spring and Summer)

OMGT 5493. Advanced Lean Six Sigma. 3 Hours.

With an emphasis on application, this course builds upon the Lean Six Sigma and Quality Management courses and covers analysis techniques for Lean Six Sigma problem solving in the Analyze, Improve, and Control phases of the DMAIC process. The topics covered include descriptive versus inferential statistics, sampling, Hypothesis Testing with Normal and Non-Normal Data, regression analysis, design of experiments, and control charts. Prerequisite: OMGT 5473 and OMGT 5373. (Typically offered: Fall, Spring and Summer)

OMGT 5503. Maintenance Management. 3 Hours.

Principles and practices of maintenance department organization, prevention procedures, and typical equipment problems. Includes related topics such as plant protection, preventative and plant maintenance. Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4333 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5613. Lean Production and Inventory Control. 3 Hours.

Defines analytical methods used to support inventory replenishment for the production of goods and services. Operational problems of production systems are examined, including objective/subjective forecasting methods, aggregate planning of work force and production under seasonal demand; and inventory models of EOQ for known and unknown demand. Supply chain management and lean manufacturing concepts are also discussed. Prerequisite: OMGT 4333 and OMGT 5003, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5623. Strategic Management. 3 Hours.

Examines strategic management, which is defined as the art and science of formulating, implementing, and evaluating cross-functional decisions that enable an organization to achieve its long-term objectives. Principles of strategic management will be covered in conjunction with case studies to provide opportunity for analysis and experience in applying these principles in an operations management environment. Required course. Prerequisite: OMGT 5003 and OMGT 4313, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5633. Linkages among Technology, Economics and Societal Values. 3 Hours.

Addresses how macro-level change is influenced by the linkages among technology, economics and societal values. Three major course initiatives: 1) Developing a conceptual model for understanding how macro-level change has occurred over history; 2) Examining recorded history in order to develop a contextual appreciation for Society's current situation; and 3) Using statistical data to identify six overriding world trends that are likely to greatly impact society's goal of achieving sustainable prosperity and well being in the foreseeable future. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)
This course is cross-listed with BENG 5633.

OMGT 5653. Introduction to Data Analytics for Operations Managers. 3 Hours.

Introduces data science and data analytics. Provides basic skill instruction in the statistical data analysis programming language R. Provides experience building and interpreting descriptive and predictive data analytics models. Provides operations managers with the skill and tools to use and understand advanced data analytics methods. Provides practice communicating those results to senior stakeholders and decision makers. Prerequisite: OMGT 5003 or EMGT 5033, must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5673. Principles of Operations Research. 3 Hours.

Surveys the mathematical models used to design and analyze operational systems. Includes linear programming models, waiting line models, computer simulation models, and management science. Students will be introduced to applications of operations research and solution methods, using spreadsheet software. Pre- or Corequisite: OMGT 5003 and OMGT 4853. Prerequisite: OMGT 4333 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5733. Human Behavior Analysis. 3 Hours.

Examination of the principal drivers of individual and group behavior in organizations with coverage of practical applications of concepts in organizational behavior for operations managers. In addition to group behavior and organizational processes, the course explores people management challenges that result from external pressures on stakeholders (e.g. competitive, economic, social, political, and regulatory impacts). Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4313 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 577V. Special Problems. 1-3 Hour.

Application of previous course work knowledge to problems encountered in military base and civilian operations. Problems are proposed by students according to individual interests and needs. Used for courses in specific concentration, certificate or focus areas with parenthetical titles. Maybe used for courses in development. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

OMGT 5783. Project Management for Operations Managers. 3 Hours.

An introduction to the Critical Path Method and Program Evaluation and Review Technique. Covers project planning and control methods; activity sequencing; time-cost trade-offs; allocation of manpower and equipment resources; scheduling activities and computer systems for PERT/CPM with emphasis on MS project. Case studies include topical issues combining methodologies and project management soft skills, such as conflict management, negotiation, presentations to stakeholders, and team building. Required course. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5793. Risk Management. 3 Hours.

Students will learn to apply tools to identify, assess, communicate and manage risk. Course work includes methods to identify risks, develop risk models, assess risk, and evaluate risk management options. Case studies are used to understand risk management challenges in systems development in complex organizations. Prerequisite: OMGT 5003 or EMGT 5033, must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5823. Information Technology for Operations Managers. 3 Hours.

Information Technology for the management and control of information systems and processes used in operations management. Topics covered include e-Business and e-Commerce Systems, Management Information Systems (MIS), Data Resource Management, Networking, Decision Support, Information Security, Enterprise and Global IT, and IT Strategies and Solutions for Operations Managers. Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4853 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5833. Decision Support Application Development for Operations Management. 3 Hours.

Students will utilize Microsoft Excel and will write programming code in Visual Basic for Applications to develop custom solutions to challenging operations management problems. Emphasis will be placed on computing productivity in a spreadsheet-based setting to develop practical, useful decision support applications and computer programs to support operations management. Assumes basic knowledge of programming. Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4853 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5873. Organizing for Change. 3 Hours.

Provides an overview of fundamental management functions, organizational decision-making authority, structures and controls to support managing change. Topics include leadership, strategy and ethical perspectives on change management. Pre- or Corequisite: OMGT 5003. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5903. Operations Management of Unmanned Aircraft Systems. 3 Hours.

Course focuses on the fundamentals of UAS operations and the applications of UAS systems in research, government and business applications. Modules covers government compliance, licensing/certification requirements, University Policy and current events in the UAS field. Prepares students to participate in research or UAS operational roles. Discusses policy and process issues in society and considerations for ethical UAS use. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5933. Cybersecurity for Operations Managers. 3 Hours.

The cybersecurity for operations managers course introduces strategic and tactical processes to implement the National Institute of Standards and Technology (NIST) Risk Management Framework (RMF). Additionally, the Body of Knowledge for the American Society of Industrial Security is applied to each process and procedure. Managers and Leaders responsible for cybersecurity, with or without an IT background, are provided a logical RMF to establish an effective cybersecurity program in their organization. (Typically offered: Fall, Spring and Summer)

OMGT 5983. Advanced Project Management. 3 Hours.

This course builds upon the project management for operations managers' course and offers students an opportunity to apply advanced project management tools to manage troubled projects. Topics include determining the project status using the schedule baseline, cost estimations, and earned value management techniques. Students will learn how to perform a project assessment/audit and will create a troubled project recovery plan. The course includes presentations of case study assignments to gain experience in communicating the status and recovery of failed and troubled projects. Prerequisite: OMGT 5783 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5993. Homeland Security for Operations Managers. 3 Hours.

Introduces concepts of Homeland Security in industry and government settings. Covers basic legal and compliance programs and risk management processes. Explains the continuity between critical infrastructure, government and private sector roles. Focuses on system design and understanding of the National Incident Management System protecting the homeland. Introduces cybersecurity and intelligence analysis concepts. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 600V. Master's Thesis. 1-6 Hour.

Master's thesis option for OMGT students. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Philosophy (PHIL)

Edward Minar
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Erik Funhouser
Chair of Graduate Committee
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Department of Philosophy Website (<http://fulbright.uark.edu/departments/philosophy/>)

Degrees Conferred:

M.A., Ph.D. (PHIL)

Areas of Study: History of philosophy (including ancient, medieval, modern, early analytic, and continental), metaphysics, epistemology, ethics, social and political philosophy, philosophy of language, philosophy of mind, philosophy of religion, and philosophy of science.

Requirements for M.A. in Philosophy

Prerequisites to Degree Program: Admission to the program is subject to the approval of the graduate committee of the Department of Philosophy. For the M.A., the normal expectation is 18 hours in philosophy, including logic. Students with fewer hours in philosophy may be admitted with deficiencies. In addition to the materials required by the Graduate School, at least two letters of recommendation, a sample of written work, and GRE aptitude scores (if available) should be submitted to the department chair. For the Ph.D., completion of an M.A. degree in philosophy is required.

Requirements for the Master of Arts Degree: (Min. 33 hours.)

1. 27 total hours of course work with a cumulative GPA of 3.00 or better. These hours must include:
 - a. Satisfaction of the course distribution requirement, which is as follows: one course each in ancient Greek philosophy, modern philosophy, value theory, and metaphysics/epistemology. Only courses in which the student earns a grade of "B" or better will count towards fulfilling the course distribution requirement. A student may petition the graduate committee to take an exam in one or more of the above areas, which, if passed, would satisfy the distribution requirement for the area(s) in question.
 - b. Symbolic Logic I or II with a grade of "C" or better, or equivalent, or exam in symbolic logic.
 - c. Nine hours of course work in graduate seminars.
2. An acceptable thesis and a successful oral examination before the thesis committee. With the approval of the graduate committee, the oral exam may be taken a second time.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Ph.D. in Philosophy

Prerequisites to Degree Program: Admission to the program is subject to the approval of the graduate committee of the Department of Philosophy. In addition to the materials required by the Graduate School, at least two letters of recommendation, a sample of written work, and GRE aptitude scores (if available) should be submitted to the department chair. For the Ph.D., completion of an M.A. degree in philosophy is required.

Requirements for the Doctor of Philosophy Degree:

1. 24 hours of course work beyond completion of the M.A. in philosophy (with the approval of the graduate committee, up to six hours may be taken in another discipline). Course work beyond the M.A. must satisfy the following conditions:
 - a. Only courses in which a "B" or better is earned count toward the 24 hours of course work required for the Ph.D.
 - b. Symbolic Logic I or II, or equivalent, or exam in symbolic logic. (This requirement is waived for candidates who have completed the above M.A. program.)
 - c. At least nine hours of graduate seminar work in philosophy.
 - d. By the time final course work is taken, students must have satisfied course distribution requirements comparable to those for the M.A. degree (1a., above).
2. Qualifying Examinations:
 - a. Comprehensive Exam: The student must pass a comprehensive examination of his or her main area of specialization.
 - b. Prospectus Exam: The student must write a dissertation proposal and pass an oral preliminary dissertation examination covering the proposal and the topic of the dissertation.
3. An acceptable dissertation, successfully defended before the dissertation committee.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Through an agreement with the Academic Common Market (p. 489), residents of certain Southern states may qualify for graduate enrollment in the doctoral program in philosophy as in-state students for fee purposes.

Graduate Faculty

Adler, Jacob, Ph.D., A.B. (Harvard University), Associate Professor, 1984.

Barrett, David A., Ph.D., M.A. (University of Arkansas), B.A. (Hendrix College), Instructor, 2006.

Funkhouser, Eric M., Ph.D. (Syracuse University), M.A., B.A. (University of Nebraska-Lincoln), Professor, 2002.

Hereth, Stephen Blake, Ph.D. (University of Washington), Visiting Assistant Professor, 2019.

Herold, Warren, Ph.D. (University of Michigan), Assistant Professor, 2014.

Hyman, Jeremy S., C.Phil. (University of California, Los Angeles), M.A. (Princeton University), B.A. (University of Michigan), Instructor, 2013.

Lee, Richard N., Ph.D. (Stanford University), B.A. (Luther College), Associate Professor, 1982.

McMullen, Amanda, Ph.D. (University of Miami), B.A. (Stetson University), Assistant Professor, 2019.

Minar, Edward H., Ph.D., A.M., A.B. (Harvard University), Professor, 1994.

Reece, Bryan, Ph.D. (University of Toronto), M.St. (University of Oxford), M.A. (University of Oklahoma), B.A. (Oklahoma Baptist University), Assistant Professor, 2020.

Senor, Thomas D., Ph.D., M.A. (University of Arizona), B.S. (University of Oregon), Professor, 1989.

Stevens, Christopher W., Ph.D. (University of Maryland College Park), M.A. (City University of New York-The Graduate Center), B.A. (Humboldt State University), Instructor, 2015.

Ward, Barry M., Ph.D. (Rutgers State University-New Brunswick), M.Sc., B.A.Mod. (Trinity College, Dublin), Associate Professor, 2002.

Courses

PHIL 5003. Ancient Greek Philosophy. 3 Hours.

(Formerly PHIL 4003.) Pre-Socratics, Socrates, Plato, and Aristotle. Graduate degree credit will not be given for both PHIL 4003 and PHIL 5003. Prerequisite: Three hours of philosophy coursework. (Typically offered: Fall)

PHIL 5013. Platonism and Origin of Christian Theology. 3 Hours.

(Formerly PHIL 4013.) The study of Plato, Middle Platonism, and Neoplatonism, including Philo, Plotinus, and Proclus, and the influence of Platonism on the Greek church fathers of the 2nd-5th centuries, principally Origen and Gregory of Nyssa and also Pseudo-Dionysius. Graduate degree credit will not be given for both PHIL 4013 and PHIL 5013. Prerequisite: Three hours of philosophy coursework. (Typically offered: Irregular)

PHIL 5023. Medieval Philosophy. 3 Hours.

(Formerly PHIL 4023.) Includes Augustine, Bonaventure, Aquinas, Scotus, and Ockham. Graduate degree credit will not be given for both PHIL 4023 and PHIL 5023. (Typically offered: Irregular)

PHIL 5033. Modern Philosophy-17th and 18th Centuries. 3 Hours.

(Formerly PHIL 4033.) British and Continental philosophy, including Bacon, Descartes, Spinoza, Leibniz, Hobbes, Locke, Berkeley, Hume, and Kant. Graduate degree credit will not be given for both PHIL 4033 and PHIL 5033. (Typically offered: Spring)

PHIL 5043. Nineteenth Century Continental Philosophy. 3 Hours.

(Formerly PHIL 4043.) Study of major Continental European philosophers of the 19th century including Hegel, Marx, Kierkegaard, Schopenhauer, Nietzsche. Emphasis on the nature of persons, the question of freedom, and the importance of self-expression, as well as views on knowledge, reality, and the nature of philosophy. Graduate degree credit will not be given for both PHIL 4043 and PHIL 5043. Prerequisite: 3 hours of Philosophy. (Typically offered: Irregular)

PHIL 5063. Twentieth Century Continental Philosophy. 3 Hours.

(Formerly PHIL 4063.) Study of major figures (e.g. Husserl, Heidegger, Sartre, Foucault, Derrida) and trends (phenomenology, existentialism, hermeneutics, critical theory, deconstruction) in 20th century French and German thought. Topics include human beings and their place in the world, the role of history and culture, and the possibility of critical reflection. Graduate degree credit will not be given for both PHIL 4063 and PHIL 5063. (Typically offered: Irregular)

PHIL 5073. History of Analytic Philosophy. 3 Hours.

(Formerly PHIL 4073.) From Frege to recent figures, including Russell, Moore, Wittgenstein, Schlick, Carnap, Ayer, Ryle, Strawson, Quine, including a representative sample of works on the logical analysis of language, logical positivism, and ordinary language analysis. Graduate degree credit will not be given for both PHIL 4073 and PHIL 5073. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5093. Special Topics in Philosophy. 3 Hours.

(Formerly PHIL 4093.) This course will cover subject matter not covered in regularly offered courses. Graduate degree credit will not be given for both PHIL 4093 and PHIL 5093. Course cannot be repeated when topic is the same as one for which the student has been previously enrolled. (Typically offered: Irregular) May be repeated for degree credit.

PHIL 5103. Modern Jewish Thought. 3 Hours.

(Formerly PHIL 4103.) A survey of the main trends in Jewish thought from the seventeenth through the nineteenth century. Graduate degree credit will not be given for both PHIL 4103 and PHIL 5103. (Typically offered: Irregular)

PHIL 5113. Social and Political Philosophy. 3 Hours.

(Formerly PHIL 4113.) Selected philosophical theories of society, the state, social justice, and their connections with individuals. Graduate degree credit will not be given for both PHIL 4113 and PHIL 5113. (Typically offered: Irregular)

PHIL 5123. Classical Ethical Theory. 3 Hours.

(Formerly PHIL 4123.) Study of classical texts in the history of philosophical ethics from Plato to Nietzsche. Philosophers covered may include Plato, Aristotle, Butler, Hume, Kant, and Mill. Graduate degree credit will not be given for both PHIL 4123 and PHIL 5123. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5133. Contemporary Ethical Theory. 3 Hours.

(Formerly PHIL 4133.) A study of contemporary texts in philosophical ethics from G.E. Moore to the present. Philosophers covered may include Moore, Stevenson, Hare, Foot, and Rawls. Graduate degree credit will not be given for both PHIL 4133 and PHIL 5133. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5143. Philosophy of Law. 3 Hours.

(Formerly PHIL 4143.) A philosophical consideration of the nature of law, theory of adjudication, concepts of legal responsibility, liberty and the limits of law, and selected moral-legal issues (abortion, affirmative action, punishment, etc.). Graduate degree credit will not be given for both PHIL 4143 and PHIL 5143. (Typically offered: Irregular)

PHIL 5183. Kant's Critique of Pure Reason. 3 Hours.

(Formerly PHIL 4183.) In his Critique of Pure Reason, one of the most important works in the history of philosophy, Kant describes how the mind works and claims to solve the major problems of metaphysics. The course is aimed at coming to a basic understanding of Kant's thought and at thinking critically about his claims. Graduate degree credit will not be given for both PHIL 4183 and PHIL 5183. (Typically offered: Irregular)

PHIL 5203. Theory of Knowledge. 3 Hours.

(Formerly PHIL 4203.) An examination of skepticism, the nature and structures of knowledge and epistemic justification, human rationality, and the justification of religious belief. Graduate degree credit will not be given for both PHIL 4203 and PHIL 5203. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5213. Philosophy of Science. 3 Hours.

(Formerly PHIL 4213.) Examination of issues related to scientific explanation, empirical foundations of science, observation and objectivity, nature of laws and theories, realism and instrumentalism, induction and confirmation, models, causation, and simplicity, beginning with historical survey set in the context of the history of science but emphasizing works from the 1930s to the current period, often including issues in recent physics. Graduate degree credit will not be given for both PHIL 4213 and PHIL 5213. (Typically offered: Irregular)

PHIL 5233. Philosophy of Language. 3 Hours.

(Formerly PHIL 4233.) A survey of mainstream philosophical theories of meaning, reference, truth, and logical form. Attention given to the views of such figures as Frege, Russell, Tarski, Searle, Dummett, and the advocates of possible world's semantics. Graduate degree credit will not be given for both PHIL 4233 and PHIL 5233. (Typically offered: Irregular)

PHIL 5253. Symbolic Logic I. 3 Hours.

(Formerly PHIL 4253.) Rigorous analyses of the concepts of proof, consistency, equivalence, validity, implication, and truth. Full coverage of truth-functional logic and quantification theory (predicate calculus). Discussion of the nature and limits of mechanical procedures (algorithms) for proving theorems in logic and mathematics. Informal accounts of the basic facts about infinite sets. Graduate degree credit will not be given for both PHIL 4253 and PHIL 5253. Prerequisite: PHIL 2203 or MATH 2603. (Typically offered: Fall)
This course is cross-listed with MATH 5263.

PHIL 5303. Philosophy of Religion. 3 Hours.

(Formerly PHIL 4303.) Types of religious belief and critical examination of their possible validity, including traditional arguments and contemporary questions of meaning. Graduate degree credit will not be given for both PHIL 4303 and PHIL 5303. (Typically offered: Irregular)

PHIL 5313. Contemporary Jewish Thought. 3 Hours.

(Formerly PHIL 4313.) A survey of trends in Jewish thought in the twentieth and twenty-first centuries, focusing on the ways in which Jewish thinkers have responded to the events affecting Jews and the conditions of Jewish life from approximately 1900 to the present. Graduate degree credit will not be given for both PHIL 4313 and PHIL 5313. (Typically offered: Irregular)

PHIL 5403. Philosophy of Art. 3 Hours.

(Formerly PHIL 4403.) Varieties of truth and value in the arts and aesthetic experience, focusing on the creative process in the art and in other human activities. Graduate degree credit will not be given for both PHIL 4403 and PHIL 5403. (Typically offered: Spring)

PHIL 5423. Philosophy of Mind. 3 Hours.

(Formerly PHIL 4423.) An examination of such topics such as the relationship between mind and body, the mentality of machines, knowledge of other minds, the nature of psychological explanation, the relationships between psychology and the other sciences, mental representation, the nature of the self, and free will and determinism. Graduate degree credit will not be given for both PHIL 4423 and PHIL 5423. (Typically offered: Irregular)

PHIL 5603. Metaphysics. 3 Hours.

(Formerly PHIL 4603.) Theory and critical analysis of such basic metaphysical problems as mind and body, universals and particulars, space and time, determinism and free will, self-identity and individualism, with emphasis on contemporary perspectives. Graduate degree credit will not be given for both PHIL 4603 and PHIL 5603. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5823. Seminar: Spinoza. 3 Hours.

Seminar: Spinoza (Typically offered: Irregular)

PHIL 5883. Seminar: Wittgenstein. 3 Hours.

Seminar: Wittgenstein (Typically offered: Irregular)

PHIL 5983. Philosophical Seminar. 3 Hours.

Various topics and issues in historical and contemporary philosophy. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

PHIL 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PHIL 690V. Graduate Readings. 1-6 Hour.

Supervised individual readings in historical and contemporary philosophy. (Typically offered: Fall, Spring and Summer)

PHIL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Physical Education (PHED)

Matthew S. Ganio

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Paul Calleja
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Health, Human Performance and Recreation Website (<http://hhpr.uark.edu/>)

Degrees Conferred:

M.Ed. in Physical Education (PHED)

Program Description: The Master of Education degree in Physical Education is a 33-credit-hour program that includes a 6-credit-hour research component (statistics/research) and a 27-credit-hour program core. All degree candidates must successfully pass a culminating written comprehensive examination and achieve a minimum of 3.0/4.0 GPA to graduate. Two courses using Web technology (Blackboard and other online resources) will be offered every semester (Fall, Spring, Summer) and the entire degree program can be completed in a two-year period. The online Master of Education Degree program is designed to meet the needs of current professionals in the field (physical education teachers, athletic directors, coaches) who desire to attain further education and an advanced degree in physical education.

M.Ed. in Physical Education

Prerequisites to the M.Ed. Degree Program: For acceptance to the master's degree program in physical education, the program area stipulates, in addition to the general requirements of the Graduate School, an undergraduate degree in physical education or in a related field. Additional prerequisites may be prescribed by the program area.

Requirements for the Master's of Education Degree: Candidates for the master's degree in physical education must complete 27 semester hours of graduate work and a thesis or 33 semester hours without a thesis. In addition to the program requirements listed below, all candidates must successfully complete a written comprehensive examination.

Physical Education: (33 hours)

Required Courses

HHPR 5353	Research in Health, Human Performance and Recreation	3
PHED 5253	The Physical Education Curriculum	3
PHED 5273	Professional Issues in Physical Education and Sport	3
PHED 5313	Risk Management in Physical Education & Athletics	3
PHED 5243	Sport Skill Assessment and Instructional Strategies	3
PHED 5553	Scientific Principles of Movement and Performance	3
PHED 5643	Motor Learning	3
PHED 5753	Sport Psychology	3
PHED 6363	Supervision in Physical Education	3
PHED 5803	Measurement Concepts for K-12 Physical Education Teachers	3

PHED 6723	Project Implementation and Data Analysis	3
Total Hours		33

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Courses

PHED 5243. Sport Skill Assessment and Instructional Strategies. 3 Hours.

The focus of this course is practical assessment techniques and instructional strategies in the area of sport and physical education activities. (Typically offered: Fall and Summer)

PHED 5253. The Physical Education Curriculum. 3 Hours.

Principles, problems, procedures, and the influence of educational philosophy on programs in physical education and their application in the construction of a course of study for a specific situation. (Typically offered: Fall and Summer)

PHED 5273. Professional Issues in Physical Education and Sport. 3 Hours.

A review of contemporary research literature informing effective teaching practices in physical education settings. Students gain experience in critically reviewing literature and discussing current issues. (Typically offered: Fall and Summer)

PHED 5313. Risk Management in Physical Education & Athletics. 3 Hours.

This course is designed to provide opportunities for the student to acquire an understanding of how to reduce the risk of injuries and eliminate hazards that may contribute to injuries associated with physical education and athletics. (Typically offered: Spring and Summer)

PHED 5483. Conducting Research in Physical Education. 3 Hours.

Methods and techniques of research in physical education, including an analysis of examples of their use and practice in their application to problems of interest to the student. Prerequisite: Students must be currently enrolled in the online MEd in Physical Education program. (Typically offered: Fall, Spring and Summer)

PHED 5553. Scientific Principles of Movement and Performance. 3 Hours.

This course focuses on theoretical information about sport biomechanics and movement principles, with practical applications to the physical education of coaching profession. (Typically offered: Spring and Summer)

PHED 5643. Motor Learning. 3 Hours.

Concepts of motor learning and control are presented. Attention is given to an analysis of the literature in movement control, motor behavior, and motor learning. (Typically offered: Fall and Spring)

PHED 5753. Sport Psychology. 3 Hours.

Investigation of historical and contemporary research in sport psychology. (Typically offered: Spring and Summer)

PHED 5803. Measurement Concepts for K-12 Physical Education Teachers. 3 Hours.

This course focuses on techniques that physical education teachers can use to monitor student progress in a K-12 environment. (Typically offered: Spring and Summer)

PHED 6363. Supervision in Physical Education. 3 Hours.

The focus of this course is instructional supervision as a set of complex processes in which the supervisor works within accepted guidelines and functions to effectively supervise a teacher's pedagogical development. The Physical Education Instructional Supervision (PEIS) Model will be used to help facilitate this process. (Typically offered: Fall and Spring)

PHED 6723. Project Implementation and Data Analysis. 3 Hours.

This course is designed to provide students with the tools to identify, develop, and submit grant proposals. (Typically offered: Fall and Spring)

Physics (PHYS)

William Oliver

Department Chair
226 Physics Building
479-575-2506
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Surendra Singh
Chair, Graduate Affairs Committee
226 Physics Building
479-575-2506
Email: ssingh@uark.edu

Department of Physics Website (<http://www.uark.edu/depts/physics/>)

Degrees Conferred:

M.S., Ph.D. (PHYS)

Primary Areas of Faculty Research: Atomic and molecular physics; biophysics; condensed matter physics; laser physics; nanoscience; physics education; quantum optical physics; space and planetary sciences; surface physics; and theoretical physics.

Prerequisites to M.S. and Ph.D. Degree Programs: Prospective students must satisfy the requirements of the Graduate School as described in this catalog and have the approval of the Graduate Admissions Committee of the Department of Physics. In addition, to be admitted to graduate study in physics without deficiency, candidates should have an undergraduate degree with the equivalent of a 30-hour major in physics including intermediate-level courses in mechanics, electricity and magnetism, quantum physics and thermal physics, and mathematics through differential equations. Students who present less than the above may be admitted with deficiency dependent on degree track subject to the approval of the department's Graduate Admissions Committee. Students may eliminate deficiencies while concurrently enrolling in graduate courses, provided prerequisites are met. While submission of Graduate Record Examination scores is not required for admission, students who have taken the GRE advanced physics test are urged to submit their test scores to the physics department to facilitate advising and placement.

M.S. in Physics

Requirements for the Master of Science Degree: Students may choose between two Master of Science degrees in the physics department. These are the M.S. Physics (30-hour thesis path); and the M.S. Physics (36-hour non-thesis path). Both M.S. degree curricula prepare a student for the Physics Ph.D. degree.

Incoming graduate students will be advised by a departmental graduate adviser for the first two years. Students must form their thesis or advisory committees by the end of their third academic semester and file the appropriate forms with the Graduate School. The thesis committee (thesis-path students) consists of the research adviser as chair, two members of the physics faculty, and one member of the graduate faculty not from the Physics Department. The advisory committee (for non-thesis-path students) consists of the individual study project adviser as chair and two members of the physics faculty. Students in this degree program can choose either a 30-semester-hour thesis path or a 36-semester-hour non-thesis path.

Both the thesis and non-thesis M.S. degrees share the following academic requirements: Completion of:

PHYS 5011	Introduction to Current Physics Research Seminar	1
PHYS 5073	Mathematical Methods for Physics	3

PHYS 5413	Quantum Mechanics I	3
PHYS 5313	Advanced Electromagnetic Theory I	3
PHYS 5323	Advanced Electromagnetic Theory II	3
PHYS 5111	Research Techniques Through Laboratory Rotations	1
PHYS 5041	Journal Club Seminar	1

Students who have had similar courses at another institution may substitute up to 12 credit hours of other courses in lieu of those listed above, on a course-by-course basis, upon petitioning the Graduate Affairs Committee.

Elective courses will be used for the remaining required degree hour. The minimum number of physics elective hours, the maximum number of non-physics technical elective hours, and the minimum number of total elective hours are shown in the table.

Degree	Physics Electives	Technical Electives	Total Electives
M.S. Physics Thesis	9	0	9
M.S. Physics Non-Thesis	18	0	18

Students will select electives from courses listed in the graduate catalog as appropriate to their field of specialization, with course selection approved by their thesis committee. For the purposes of this degree requirement, any Astronomy (ASTR) graduate course listed in the Graduate Catalog and taught through the physics department will be considered a Physics elective.

No more than one 4000-level course may be counted toward the 30-hour requirement for the thesis option, and no more than two 4000-level courses may be counted toward the 36-hour requirement for the non-thesis option.

Requirements for Thesis-Path M.S. Degrees: Completion of six master's thesis hours under PHYS 600V and a written thesis successfully defended in a comprehensive oral exam given by the student's thesis committee.

Requirements for Non-thesis Path M.S. Degrees: Completion of three hours under PHYS 502V Individual Study in Advanced Physics and a written project report successfully defended in a comprehensive oral exam given by the student's advisory committee. Students who pass the Physics Ph.D. candidacy examination will be considered to have satisfied the PHYS 502V requirement of the non-thesis path M.S. degrees.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Ph.D. in Physics

Requirements for the Doctor of Philosophy Degree: To be admitted to candidacy for the Ph.D. degree the student must:

1. Form a dissertation committee
2. Pass the research-based candidacy exam
3. Obtain a minimum of B-grade in core physics courses and
4. File a Declaration of Intent with the Graduate School.

Incoming graduate students will be advised by a departmental adviser for the first year. Students must form their dissertation committees by the

end of their second academic semester and file the appropriate forms with the Graduate School. The dissertation committee consists of the research adviser as chair and two other members of the graduate faculty.

The research-based candidacy examination, also known as the Ph.D. qualifier, consists of a written proposal and oral presentation. All students entering the Ph.D. graduate program in the fall semester must take their qualifier no later than the end of their fifth semester of graduate studies. Students entering the Ph.D. graduate program in the spring semester must take their qualifier no later than the end of their sixth semester of graduate studies. Especially well-prepared students are encouraged to take their qualifier earlier. A candidate failing the research-based qualifier in a first attempt, will have one additional semester (two if they change adviser) for a second and final attempt.

Ph.D. students must complete a minimum of 33 semester-hours in 5000- and/or 6000-level courses beyond their Bachelor of Science degrees. Courses taken to fulfill the requirements for the University of Arkansas M.S. physics degrees can be included in this 33 semester-hour requirement. Students who have had similar courses as part of an M.S. physics program at another institution may obtain a waiver, on a course-by-course basis, upon petitioning to the Physics Graduate Affairs Committee.

Ph.D. students must take:

PHYS 5011	Introduction to Current Physics Research Seminar	1
PHYS 5111	Research Techniques Through Laboratory Rotations	1
PHYS 5041	Journal Club Seminar	1
PHYS 5073	Mathematical Methods for Physics	3
PHYS 5103	Advanced Mechanics	3
PHYS 5213	Statistical Mechanics	3
PHYS 5313	Advanced Electromagnetic Theory I	3
PHYS 5413	Quantum Mechanics I	3

A minimum grade of B is required in the following core courses:

PHYS 5073	Mathematical Methods for Physics
PHYS 5103	Advanced Mechanics
PHYS 5213	Statistical Mechanics
PHYS 5313	Advanced Electromagnetic Theory I
PHYS 5413	Quantum Mechanics I

If a minimum grade of B is not obtained, the course may be repeated once. If the student cannot obtain a minimum of B on two attempts, the student will not be allowed to continue in the Ph.D. program.

Fifteen additional semester hours in elective physics graduate courses will be required, and they must be selected from the 5000- or 6000-level courses listed in the graduate catalog appropriate to the student's field of specialization and approved by the student's dissertation advisory committee. For the purposes of this degree requirement, any Astronomy (ASTR) graduate course listed in the Graduate Catalog and taught through the physics department will be considered a physics elective. Additional elective courses outside of the physics department may be taken with dissertation committee approval.

Physics Ph.D. students may also choose one of the following concentrations by meeting its requirements: Astrophysics, Biophysics, or Neuroscience. Students who do not choose one of the three

concentrations will pursue the general Physics Ph.D. requirements by default.

Requirements for Ph.D. in Physics with Astrophysics Concentration

Requirements for the Doctor of Philosophy Degree: To be admitted to candidacy for the Ph.D. degree the student must:

1. Form a dissertation committee
2. Pass the research-based candidacy exam
3. Obtain a minimum of B-grade in core physics courses and
4. File a Declaration of Intent with the Graduate School.

Incoming graduate students will be advised by a departmental adviser for the first year. Students must form their dissertation committees by the end of their second academic semester and file the appropriate forms with the Graduate School. The dissertation committee consists of the research adviser as chair and two other members of the graduate faculty.

The research-based candidacy examination, also known as the Ph.D. qualifier, consists of a written proposal and oral presentation. All students entering the Ph.D. graduate program in the fall semester must take their qualifier no later than the end of their fifth semester of graduate studies. Students entering the Ph.D. graduate program in the spring semester must take their qualifier no later than the end of their sixth semester of graduate studies. Especially well-prepared students are encouraged to take their qualifier earlier. A candidate failing the research-based qualifier in a first attempt, will have one additional semester (two if they change adviser) for a second and final attempt.

Ph.D. students must complete a minimum of 33 semester-hours in 5000- and/or 6000-level courses beyond their Bachelor of Science degrees. Courses taken to fulfill the requirements for the University of Arkansas M.S. physics degrees can be included in this 33 semester-hour requirement. Students who have had similar courses as part of an M.S. physics program at another institution may obtain a waiver, on a course-by-course basis, upon petitioning to the Physics Graduate Affairs Committee.

Ph.D. students must take:

PHYS 5011	Introduction to Current Physics Research Seminar	1
PHYS 5111	Research Techniques Through Laboratory Rotations	1
PHYS 5041	Journal Club Seminar	1
PHYS 5073	Mathematical Methods for Physics	3
PHYS 5103	Advanced Mechanics	3
PHYS 5213	Statistical Mechanics	3
PHYS 5313	Advanced Electromagnetic Theory I	3
PHYS 5413	Quantum Mechanics I	3

A minimum grade of B is required in the following core courses:

PHYS 5073	Mathematical Methods for Physics
PHYS 5103	Advanced Mechanics
PHYS 5213	Statistical Mechanics
PHYS 5313	Advanced Electromagnetic Theory I
PHYS 5413	Quantum Mechanics I

If a minimum grade of B is not obtained, the course may be repeated once. If the student cannot obtain a minimum of B on two attempts, the student will not be allowed to continue in the Ph.D. program.

Fifteen additional semester hours in elective physics graduate courses will be required, and they must be selected from the 5000- or 6000-level courses listed in the graduate catalog appropriate to the student's field of specialization and approved by the student's dissertation advisory committee. For the purposes of this degree requirement, any Astronomy (ASTR) graduate course listed in the Graduate Catalog and taught through the physics department will be considered a physics elective. Additional elective courses outside of the physics department may be taken with dissertation committee approval.

Physics Ph.D. students may also choose one of the following concentrations by meeting its requirements: Astrophysics, Biophysics, or Neuroscience. Students who do not choose one of the three concentrations will pursue the general Physics Ph.D. requirements by default.

Requirements for Astrophysics Concentration: Students must also take:

ASTR 5033	Astrophysics I: Stars and Planetary Systems	3
ASTR 5043	Astrophysics II: Galaxies and the Large-Scale Universe	3

Nine additional hours in elective coursework appropriate to the student's field of specialization and approved by the student's research thesis advisory committee. 9

Ph.D. students must also earn 18 hours of credit in Doctoral Dissertation, submit a dissertation, and defend it successfully in a comprehensive oral examination given by the dissertation committee. The doctoral degree will be awarded to students who complete a minimum of 72-graduate semester credit hours beyond the bachelor's degree.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Requirements for Ph.D. in Physics with Biophysics Concentration

Requirements for the Doctor of Philosophy Degree: To be admitted to candidacy for the Ph.D. degree the student must:

1. Form a dissertation committee
2. Pass the research-based candidacy exam
3. Obtain a minimum of B-grade in core physics courses and
4. File a Declaration of Intent with the Graduate School.

Incoming graduate students will be advised by a departmental adviser for the first year. Students must form their dissertation committees by the end of their second academic semester and file the appropriate forms with the Graduate School. The dissertation committee consists of the research adviser as chair and two other members of the graduate faculty.

The research-based candidacy examination, also known as the Ph.D. qualifier, consists of a written proposal and oral presentation. All students entering the Ph.D. graduate program in the fall semester must take their qualifier no later than the end of their fifth semester of graduate studies. Students entering the Ph.D. graduate program in the spring semester must take their qualifier no later than the end of their sixth semester of graduate studies. Especially well-prepared students are encouraged to take their qualifier earlier. A candidate failing the research-based qualifier

in a first attempt, will have one additional semester (two if they change adviser) for a second and final attempt.

Ph.D. students must complete a minimum of 33 semester-hours in 5000- and/or 6000-level courses beyond their Bachelor of Science degrees. Courses taken to fulfill the requirements for the University of Arkansas M.S. physics degrees can be included in this 33 semester-hour requirement. Students who have had similar courses as part of an M.S. physics program at another institution may obtain a waiver, on a course-by-course basis, upon petitioning to the Physics Graduate Affairs Committee.

Ph.D. students must take:

PHYS 5011	Introduction to Current Physics Research Seminar	1
PHYS 5111	Research Techniques Through Laboratory Rotations	1
PHYS 5041	Journal Club Seminar	1
PHYS 5073	Mathematical Methods for Physics	3
PHYS 5103	Advanced Mechanics	3
PHYS 5213	Statistical Mechanics	3
PHYS 5313	Advanced Electromagnetic Theory I	3
PHYS 5413	Quantum Mechanics I	3

A minimum grade of B is required in the following core courses:

PHYS 5073	Mathematical Methods for Physics
PHYS 5103	Advanced Mechanics
PHYS 5213	Statistical Mechanics
PHYS 5313	Advanced Electromagnetic Theory I
PHYS 5413	Quantum Mechanics I

If a minimum grade of B is not obtained, the course may be repeated once. If the student cannot obtain a minimum of B on two attempts, the student will not be allowed to continue in the Ph.D. program.

Fifteen additional semester hours in elective physics graduate courses will be required, and they must be selected from the 5000- or 6000-level courses listed in the graduate catalog appropriate to the student's field of specialization and approved by the student's dissertation advisory committee. For the purposes of this degree requirement, any Astronomy (ASTR) graduate course listed in the Graduate Catalog and taught through the physics department will be considered a physics elective. Additional elective courses outside of the physics department may be taken with dissertation committee approval.

Physics Ph.D. students may also choose one of the following concentrations by meeting its requirements: Astrophysics, Biophysics, or Neuroscience. Students who do not choose one of the three concentrations will pursue the general Physics Ph.D. requirements by default.

Requirements for Biophysics Concentration: Students must also take:

BIOL 4793	Introduction to Neurobiology	3
PSYC 4183	Behavioral Neuroscience	3

Nine additional hours in elective coursework appropriate to the student's field of specialization and approved by the student's research thesis advisory committee. 9

Ph.D. students must also earn 18 hours of credit in Doctoral Dissertation, submit a dissertation, and defend it successfully in a comprehensive oral

examination given by the dissertation committee. The doctoral degree will be awarded to students who complete a minimum of 72-graduate semester credit hours beyond the bachelor's degree.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Requirements for Ph.D. in Physics with Neuroscience Concentration

Requirements for the Doctor of Philosophy Degree: To be admitted to candidacy for the Ph.D. degree the student must:

1. Form a dissertation committee
2. Pass the research-based candidacy exam
3. Obtain a minimum of B-grade in core physics courses and
4. File a Declaration of Intent with the Graduate School.

Incoming graduate students will be advised by a departmental adviser for the first year. Students must form their dissertation committees by the end of their second academic semester and file the appropriate forms with the Graduate School. The dissertation committee consists of the research adviser as chair and two other members of the graduate faculty.

The research-based candidacy examination, also known as the Ph.D. qualifier, consists of a written proposal and oral presentation. All students entering the Ph.D. graduate program in the fall semester must take their qualifier no later than the end of their fifth semester of graduate studies. Students entering the Ph.D. graduate program in the spring semester must take their qualifier no later than the end of their sixth semester of graduate studies. Especially well-prepared students are encouraged to take their qualifier earlier. A candidate failing the research-based qualifier in a first attempt, will have one additional semester (two if they change adviser) for a second and final attempt.

Ph.D. students must complete a minimum of 33 semester-hours in 5000- and/or 6000-level courses beyond their Bachelor of Science degrees. Courses taken to fulfill the requirements for the University of Arkansas M.S. physics degrees can be included in this 33 semester-hour requirement. Students who have had similar courses as part of an M.S. physics program at another institution may obtain a waiver, on a course-by-course basis, upon petitioning to the Physics Graduate Affairs Committee.

Ph.D. students must take:

PHYS 5011	Introduction to Current Physics Research Seminar	1
PHYS 5111	Research Techniques Through Laboratory Rotations	1
PHYS 5041	Journal Club Seminar	1
PHYS 5073	Mathematical Methods for Physics	3
PHYS 5103	Advanced Mechanics	3
PHYS 5213	Statistical Mechanics	3
PHYS 5313	Advanced Electromagnetic Theory I	3
PHYS 5413	Quantum Mechanics I	3

A minimum grade of B is required in the following core courses:

PHYS 5073	Mathematical Methods for Physics
PHYS 5103	Advanced Mechanics
PHYS 5213	Statistical Mechanics

PHYS 5313	Advanced Electromagnetic Theory I
PHYS 5413	Quantum Mechanics I

If a minimum grade of B is not obtained, the course may be repeated once. If the student cannot obtain a minimum of B on two attempts, the student will not be allowed to continue in the Ph.D. program.

Fifteen additional semester hours in elective physics graduate courses will be required, and they must be selected from the 5000- or 6000-level courses listed in the graduate catalog appropriate to the student's field of specialization and approved by the student's dissertation advisory committee. For the purposes of this degree requirement, any Astronomy (ASTR) graduate course listed in the Graduate Catalog and taught through the physics department will be considered a physics elective. Additional elective courses outside of the physics department may be taken with dissertation committee approval.

Physics Ph.D. students may also choose one of the following concentrations by meeting its requirements: Astrophysics, Biophysics, or Neuroscience. Students who do not choose one of the three concentrations will pursue the general Physics Ph.D. requirements by default.

Requirements for Neuroscience Concentration: Students must also take:

BIOL 4793	Introduction to Neurobiology	3
PSYC 4183	Behavioral Neuroscience	3
	Nine additional hours in elective coursework appropriate to the student's field of specialization and approved by the student's research thesis advisory committee.	9

Ph.D. students must also earn 18 hours of credit in Doctoral Dissertation, submit a dissertation, and defend it successfully in a comprehensive oral examination given by the dissertation committee. The doctoral degree will be awarded to students who complete a minimum of 72-graduate semester credit hours beyond the bachelor's degree.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Barraza-Lopez, Salvador, Ph.D. (University of Illinois-Urbana-Champaign), B.S. (Instituto Politecnico Nacional de Mexico), Associate Professor, 2011.

Bellaiche, Laurent, Ph.D., M.S., B.S. (University of Paris VI, France), Distinguished Professor, 1999.

Churchill, Hugh O.H., Ph.D., A.M. (Harvard University), B.A. (Oberlin College), B.M. (Oberlin Conservatory of Music), Assistant Professor, 2015.

Fu, Huaxiang, Ph.D., M.S. (Fudan University), B.S. (University of Science and Technology of China), Professor, 2002.

Gea-Banacloche, Julio R., Ph.D. (University of New Mexico), Licenciado en Ciencias Fisicas (Universidad Autonoma de Madrid), Professor, 1989.

Harter, William G., Ph.D. (University of California-Irvine), B.S. (Hiram College), Professor, 1986.

Hu, Jin, Ph.D. (Tulane University), B.S. (University of Science and Technology of China), Assistant Professor, 2017.

Joffe Minor, Tacy Marie, Ph.D. (Northwestern University), M.A., B.S. (University of Arkansas), Teaching Assistant Professor, 2011.

Kenefick, Daniel John, Ph.D., M.A. (California Institute of Technology), B.S. (University College Cork, Ireland), Associate Professor, 2004.

Kennefick, Julia Dusk, Ph.D. (California Institute of Technology), B.S. (University of Arkansas), Associate Professor, 2003.

Kumar, Pradeep, Ph.D. (Boston University), M.Sc. (Indian Institute of Technology, Mumbai, India), Associate Professor, 2013.

Lehmer, Bret Darby, Ph.D. (Pennsylvania State University), B.S. (University of Iowa), Assistant Professor, 2015.

Li, Jiali, Ph.D., M.S. (City University of New York-City College), M.S. (University of Science and Technology of China), B.S. (Hei Long Jiang University), Professor, 2002.

Manasreh, Bothina H., Ph.D., M.Sc. (University of Jordan), Research Assistant Professor, 2017.

Nakamura, Hiroyuki, Ph.D., M.S., B.S. (University of Tokyo), Assistant Professor, 2019.

Oliver, William, Ph.D., M.S. (University of Colorado-Boulder), B.S. (University of Arizona), Associate Professor, 1992.

Prosandeev, Sergey, Ph.D., M.S. (Rostov State University), Research Professor, 2005.

Salamo, Gregory J., Ph.D. (City University of New York), M.S. (Indiana University-Purdue University-Indianapolis), B.S. (City University of New York, Brooklyn College), Distinguished Professor, 1975.

Shew, Woodrow L., Ph.D. (University of Maryland-College Park), B.A. (College of Wooster), Associate Professor, 2012.

Singh, Surendra P., Ph.D., M.A. (University of Rochester), M.Sc., B.Sc. (Banaras Hindu University, India), University Professor, 1982.

Thibado, Paul M., Ph.D. (University of Pennsylvania), B.S. (San Diego State University), Professor, 1996.

Vyas, Reeta, Ph.D. (State University of New York at Buffalo), M.S., B.S. (Banaras Hindu University), Professor, 1984.

Wang, Yong, Ph.D., M.S. (University of California, Los Angeles), B.S. (University of Science and Technology of China), Assistant Professor, 2016.

Wise, Rick, Ph.D., M.S. (Southern Methodist University), B.S. (University of Arkansas), Research Professor, 2014.

Xiao, Min, Ph.D. (University of Texas at Austin), B.S. (Nanjing University), Distinguished Professor, 1990.

Astronomy Courses

ASTR 5033. Astrophysics I: Stars and Planetary Systems. 3 Hours.

An introduction to astrophysics covering stellar structure and evolution, the properties of the solar system, and extrasolar planetary systems. (Typically offered: Fall Odd Years)

This course is cross-listed with SPAC 5033.

ASTR 5043. Astrophysics II: Galaxies and the Large-Scale Universe. 3 Hours.

An introduction to astrophysics covering the interstellar medium, the Milky Way galaxy, extragalactic astronomy, and introduction to cosmology. Prerequisite: ASTR 5033 or SPAC 5033. (Typically offered: Spring Even Years)

ASTR 5073. Cosmology. 3 Hours.

An introduction to modern physical cosmology covering the origin, evolution, and structure of the Universe, based on the Theory of Relativity. (Typically offered: Spring Odd Years)

ASTR 5083. Data Analysis and Computing in Astronomy. 3 Hours.

Study of the statistical analysis of large data sets that are prevalent in the physical sciences with an emphasis on astronomical data and problems. Includes computational lab 1 hour per week. Corequisite: Lab component. (Typically offered: Fall Even Years)

ASTR 5523. Theory of Relativity. 3 Hours.

Conceptual and mathematical structure of the special and general theories of relativity with selected applications. Critical analysis of Newtonian mechanics; relativistic mechanics and electrodynamics; tensor analysis; continuous media; and gravitational theory. (Typically offered: Fall Even Years)

Physics Courses

PHYS 500V. Laboratory and Classroom Practices in Physics. 1-3 Hour.

The pedagogy of curricular materials. Laboratory and demonstration techniques illustrating fundamental concepts acquired through participation in the classroom as an apprentice teacher. (Typically offered: Fall) May be repeated for up to 3 hours of degree credit.

PHYS 5011. Introduction to Current Physics Research Seminar. 1 Hour.

This seminar course introduces new Physics graduate students to the faculty of the Physics department and their current research efforts. In addition, the students will be introduced to scientific ethics, and learn communication skills. (Typically offered: Fall)

PHYS 502V. Individual Study in Advanced Physics. 1-4 Hour.

Guided study in current literature. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

PHYS 5041. Journal Club Seminar. 1 Hour.

In this seminar, the students will present talks based on published research articles. The goal of the course is to develop oral communication skills in the students. Effective literature search techniques will also be covered. (Typically offered: Spring)

PHYS 5073. Mathematical Methods for Physics. 3 Hours.

This course merges the mathematics required in classical mechanics, electrostatics, magnetostatics, and quantum mechanics into a single course. The goal is to develop physics problem-solving skills, a strong mathematical foundation, and a more unified picture of physics. (Typically offered: Fall)

PHYS 5083. Mathematical Methods of Physics II. 3 Hours.

Applications of matrices, tensors, and linear vector spaces to problems in physics. Introduction to groups and their representations, and symmetry principles in modern physics. Prerequisite: PHYS 5073. (Typically offered: Irregular)

PHYS 5093. Applications of Group Theory to Physics. 3 Hours.

Application of group theory to topics in physics, especially to atomic/molecular and solid-state physics. Prerequisite: PHYS 5073. (Typically offered: Irregular)

PHYS 5103. Advanced Mechanics. 3 Hours.

Dynamics of particles and rigid bodies. Hamilton's equations and canonical variables. Canonical transformations. Small oscillations. Prerequisite: PHYS 5073. (Typically offered: Fall)

PHYS 5111. Research Techniques Through Laboratory Rotations. 1 Hour.

Graduate students will be introduced to detailed operational aspects of two Physics research laboratories through extensive observation of those laboratory's operations during a six week rotation through each lab. Planning for starting a research project in the summer will take place in the final three week rotation period. (Typically offered: Spring)

PHYS 5213. Statistical Mechanics. 3 Hours.

Classical and quantum mechanical statistical theories of matter and radiation. Prerequisite: PHYS 5413. (Typically offered: Spring)

PHYS 5263L. Experiment and Data Analysis. 3 Hours.

This course is devoted to learning some of the frequently used experimental techniques and methods by which experimental data are analyzed to extract quantitative information on physical parameters. Students will perform experiments, analyze data, and write lab reports. Pre- or Corequisite: PHYS 5423. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall)

PHYS 5313. Advanced Electromagnetic Theory I. 3 Hours.

Electrostatics, boundary-value problems in electrostatics, electrostatics in a medium, magnetostatics, and Faraday's Law. (Typically offered: Spring)

PHYS 5323. Advanced Electromagnetic Theory II. 3 Hours.

Maxwell equations, conservation laws, wave propagation, waveguides, radiating systems, scattering, special relativity, and radiation by moving charges. (Typically offered: Fall)

PHYS 5363. Scientific Computation and Numerical Methods. 3 Hours.

An introduction to numerical methods used in solving various problems in engineering and the sciences. May not earn credit for this course and MATH 4353 or MATH 4363. (Typically offered: Fall Even Years)

This course is cross-listed with MATH 5363.

PHYS 5413. Quantum Mechanics I. 3 Hours.

Non-relativistic quantum mechanics; the Schrodinger equation; the Heisenberg matrix representation; operator formalism; transformation theory; spinors and Pauli theory; the Dirac equation; applications to atoms and molecules; collision theory; and semiclassical theory of radiation. (Typically offered: Fall)

PHYS 5423. Quantum Mechanics II. 3 Hours.

Continuation of PHYS 5413 Prerequisite: PHYS 5413. (Typically offered: Spring)

PHYS 5513. Atomic and Molecular Physics. 3 Hours.

Survey of atomic and molecular physics with emphasis on the electronic structure and spectroscopy of 1 and 2 electron atoms and diatomic molecules. Includes fine and hyperfine structure, Zeeman and Stark mixing of states, collision phenomena, radiative lifetimes, and experimental techniques. Prerequisite: PHYS 5413. (Typically offered: Irregular)

PHYS 5613. Introduction to Biophysics and Biophysical Techniques. 3 Hours.

Origins of biophysics, biological polymers and polymer physics, properties of DNA and proteins, techniques to study DNA and proteins, biological membrane and ion channels, biological energy, experimental techniques to study single DNA and proteins. Two experiments are included: (1) DNA Gel electrophoresis; (2) Measurement of double-stranded DNA melting point. (Typically offered: Spring)

PHYS 5653. Subatomic Physics. 3 Hours.

Nuclear structure and nuclear reactions. Nature and properties of elementary particles and resonances, their interactions and decays. Phenomenological theory and discussion of experimental evidence. (Typically offered: Fall Odd Years)

PHYS 5713. Condensed Matter Physics I. 3 Hours.

The course covers the Drude theory and the Sommerfeld theory of metals, crystal lattices, reciprocal lattices, X-ray diffraction, Bloch's theory of electrons in periodic potential, formation of band gap, lattice vibration, and cohesive energy in solids. Prerequisite: PHYS 5413. (Typically offered: Fall)

PHYS 5723. Physics at the Nanoscale. 3 Hours.

This is a cross-disciplinary course that is focused on teaching nanoscience and engineering by studying surface science, the building and analysis of quantum-confined structures, and related nano manufacturing processes. Students will achieve an integrated knowledge of the concepts of surface science, quantum mechanics, nano processing and manipulation, and techniques of materials research. (Typically offered: Irregular)

PHYS 5734. Laser Physics. 4 Hours.

A combined lecture/laboratory course covering the theory of laser operation, laser resonators, propagation of laser beams, specific lasers such as gas, solid state, semiconductor and chemical lasers, and laser applications. (Typically offered: Spring Odd Years)

PHYS 5753. Applied Nonlinear Optics. 3 Hours.

Topics include: practical optical processes, such as electro-optic effects, acousto-optic effects, narrow-band optical filters, second harmonic generation, parametric amplification and oscillation, and other types of nonlinear optical spectroscopy techniques which are finding current practical applications in industry. (Typically offered: Irregular)

PHYS 5763. Experimental Methods for Nanoscience. 3 Hours.

Fundamentals of the selected techniques suitable for characterization on the nanoscale. Focus on diverse methods such as x-ray and neutron spectroscopy, scanning probe microscopies, optical methods, electron diffraction methods and more. (Typically offered: Irregular)

PHYS 5773. Introduction to Optical Properties of Materials. 3 Hours.

This course covers crystal symmetry optical transmission and absorption, light scattering (Raman and Brillouin) optical constants, carrier mobility, and polarization effects in semi-conductors, quantum wells, insulators, and other optically important materials. (Typically offered: Spring Even Years)

PHYS 5783. Physics of 2D Materials. 3 Hours.

Introduction to the structures of all known layered materials, followed by mechanical, electronic, spin, optical, and topological properties of two-dimensional materials. Discussion of theoretical concepts and examination of experimental manifestations of those concepts are interwoven throughout the semester. Knowledge of solid state physics is required. Pre- or Corequisite: PHYS 5413. (Typically offered: Fall Odd Years)

PHYS 588V. Selected Topics in Physics. 1-3 Hour.

Selected topics in experimental or theoretical physics at the advanced level. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

PHYS 600V. Master of Science Thesis. 1-6 Hour.

Master of Science Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PHYS 6513. Theoretical Biophysics. 3 Hours.

Introduction to biology as a complex system, networks and information theory, negative and positive feedback systems, gene regulation, noise, and noise propagation, cell signaling pathways, intercellular interactions, and emergence of cooperativity in biological systems. Prerequisite: PHYS 5613. (Typically offered: Fall Even Years)

PHYS 6613. Quantum Optics. 3 Hours.

Properties of light and its interaction with atoms, particular attention given to the laser and recent experiments. Classical theory of resonance; Optical Bloch Eqs.; 2 level atoms in steady fields; pulse propagation; semiclassical theory of the laser, coherent states and coherent functions; gas, solid, and dye lasers; photon echoes and superradiance; quantum electrodynamics and spontaneous emission. Prerequisite: PHYS 5413 or equivalent. (Typically offered: Irregular)

PHYS 6713. Condensed Matter Physics II. 3 Hours.

The course covers surface physics, physics of homogeneous and inhomogeneous semiconductors, dielectric and ferroelectric physics, defects in crystals, spin interaction and magnetic properties, superconductivity, and band structure calculation. Prerequisite: PHYS 5713 and PHYS 5413. (Typically offered: Spring Even Years)

PHYS 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Plant Pathology (PLPA)

Kenneth Korth
Interim Department Head
217 Plant Sciences Building
479-575-2445

Email: kkorth@uark.edu

Ioannis Tzanetakis
 Graduate Coordinator
 217 Plant Sciences Building
 479-575-3180
 Email: itzaneta@uark.edu

Department email: enpl@uark.edu

Plant Pathology Program Website (<http://plantpathology.uark.edu/>)

Degree Conferred:

M.S. (PLPA)

Ph.D. in Agricultural, Food and Life Sciences (AFLS)

Primary Areas of Faculty Research: Research areas of the faculty of the Department of Plant Pathology are diverse, including fundamental studies emphasizing fungal, viral, nematode, and bacterial pathogens of plants, as well as mission-oriented research aimed at solving specific disease problems. Research projects are wide-ranging, extending from basic and molecular aspects of disease and pathogenesis to more applied research on disease control methods for the major food and fiber crops in the world. Specific areas include: fungal ecology and genetics, nematology, virology, soil ecology, molecular biology of plant pathogens, biological control of plant diseases, genetics and physiology of parasitism and resistance.

M.S. in Plant Pathology

Prerequisites to the M.S. Degree Program: Specific course prerequisites are not required for admission to the M.S. program. However, a strong undergraduate background in an agricultural, biological, and/or physical science is highly desirable. Deficiencies or prerequisites for advanced courses may be included in the individual student's academic program.

Requirements for the Master of Science Degree: A thesis reporting results of original research and a minimum of 24 semester hours of course work (including 15 semester hours in plant pathology) plus 6 semester hours of thesis credit are required. The student must pass a comprehensive oral examination and successfully defend the thesis upon its completion.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Ph.D. in AFLS with Plant Pathology Concentration

Prerequisites to Degree Program: A Master of Science degree is desirable. A student with a Bachelor of Science and an exceptional record in academics and/or research may be approved for admission to the Ph.D. program in Agricultural, Food and Life Sciences if the Graduate Student Concentration Admissions Committee of the desired concentration deems them qualified and approval is granted by the AFLSPH Steering Committee. A student admitted to the University of Arkansas, pursuing an M.S. and in good academic standing may apply to be admitted to the doctoral program and forgo completing the M.S. degree if so approved by the AFLSPH Steering Committee and the AFLSPH Graduate Concentration Admissions Committee. A minimum grade point average of 3.00 (on a 4.00 scale) on previous college-level course work is required.

Admission Requirements for Entry: To be considered for admission, a student must submit a letter of intent, along with the application for admission indicating the desired degree concentration, areas of interest and career goals. Official transcripts of all previous college-level course work must be submitted. Three letters of recommendation are required. These letters should address the character and academic capability of the applicant. Applications will first be reviewed by the AFLSPH Steering Committee which will assign the student to the appropriate Graduate Student Concentration Admissions Committee for review. The Concentration Admissions Committee will make the final determination of admittance into the AFLSPH program and the concentration.

Requirements for Doctor of Philosophy Degree: The Ph.D. program in Agricultural, Food and Life Sciences requires a minimum of 72 credit hours after a Bachelor of Science or Bachelor of Arts degree or a minimum of 42 hours after a Master of Science or Master of Arts degree.

General course requirements for each degree candidate are arranged on an individual basis by the Faculty Adviser, the Graduate Advisory Committee and the candidate in accordance with guidelines of their concentration. Alternate courses may be selected at the discretion of the committee.

All students must complete 6 hours of elective course hours and 2 hours of seminar. One seminar must be a research proposal presentation and the other must be an exit seminar presenting the dissertation research results. All students must complete 18 hours of doctoral dissertation hours. Students entering the doctoral program with only a B.S. or B.A. must also complete an additional 30 hours (to reach the 72 hour post B.S./B.A. requirement). Students must satisfactorily pass written and oral candidacy examinations covering their discipline and supporting areas. These examinations must be completed at least one year before completion of the Ph.D. degree program in Agricultural, Food and Life Sciences. Each candidate must complete a doctoral dissertation on an important research topic in the concentration field. The specific problem and subject of the dissertation is determined by the faculty adviser, the student and the Graduate Advisory Committee. A dissertation title must be submitted to the dean of the Graduate School at least one year before the dissertation defense. Provisional approval of the dissertation must be given by all members of the Graduate Advisory Committee prior to the dissertation defense. Students must pass the oral defense and examination of the dissertation given by the Graduate Advisory Committee. A student cannot be approved for conferral of the doctoral degree until after completion of all coursework, written and oral candidacy exams, the defense passed and dissertation accepted by the Graduate School and an application for the degree has been filed with the Registrar's Office and the fee paid.

In addition to the general requirements for the Ph.D. program in Agricultural, Food and Life Sciences, students in the Plant Pathology concentration must also complete:

PLPA 5303	Advanced Plant Pathology: Host-Pathogen Interactions	3
PLPA 5313	Advanced Plant Pathology: Ecology and Epidemiology	3
PLPA 5404	Diseases of Economic Crops	4
PLPA 5001	Seminar	1
One course from the following:		3
PLPA 5223	Plant Disease Control	
PLPA 5603	Plant Pathogenic Fungi	

PLPA 6203	Plant Virology
PLPA 6503	Plant Bacteriology

Graduate Faculty

Bateman, Nick, Ph.D. (Mississippi State University), B.S. (University of Arkansas-Monticello), Assistant Professor, 2016.

Bluhm, Burt H., Ph.D., M.S. (Purdue University), B.S. (University of Oklahoma), Associate Professor, 2008.

Correll, Jim, Ph.D., M.S. (University of California-Berkeley), B.S. (Pennsylvania State University), Distinguished Professor, 1989.

Dowling, Ashley Patrick Gregg, Ph.D. (University of Michigan-Ann Arbor), B.S. (University of Arizona), Professor, 2008.

Egan, Martin J., Ph.D., B.Sc. (University of Exeter, United Kingdom), Assistant Professor, 2016.

Faske, Travis, Ph.D. (Texas A&M University), M.S. (Oklahoma State University), B.S. (Tarleton State University), Associate Professor, 2015.

Goggin, Fiona, Ph.D. (University of California-Davis), B.S. (Cornell University), Professor, 2001.

Joshi, Neelendra, Ph.D. (Pennsylvania State University), Assistant Professor, 2015.

Korth, Ken L., Ph.D. (North Carolina State University), B.S. (University of Nebraska), Professor, 1999.

Loftin, Kelly M., Ph.D. (New Mexico State University), M.S. (University of Arkansas), B.S. (Arkansas Tech), Associate Professor, 2002.

Lorenz, Gus M., Ph.D., B.S.A., M.S. (University of Arkansas), Distinguished Professor, 1997.

Rojas, Alejandro, Ph.D., M.S. (Michigan State University), M.S., B.S. (Los Andes University), Assistant Professor, 2018.

Rojas, Clemencia, Ph.D. (Cornell University), M.S. (Purdue University), B.S. (Universidad de Los Andes, Colombia), Assistant Professor, 2015.

Rupe, John C., Ph.D., M.S. (University of Kentucky), B.S. (Colorado State University), University Professor, 1984.

Spradley, J. Ples, M.S. (University of Arkansas), B.S. (Hendrix College), Extension Associate Professor, 1984.

Spurlock, Terry, Ph.D. (University of Arkansas), Extension Associate Professor, 2015.

Steinkraus, Donald C., Ph.D. (Cornell University), M.S. (University of Connecticut), B.A. (Cornell University), Professor, 1989.

Studebaker, Glenn, Ph.D., M.S. (University of Arkansas), B.S. (Missouri Southern State University), Associate Professor, 1993.

Szalanski, Allen Lawrence, Ph.D. (University of Nebraska-Lincoln), M.S. (Kansas State University), B.S. (University of Manitoba), Professor, 2001.

Thrash, Ben, Assistant Professor, 2018.

Tzanetakis, Ioannis E., Ph.D. (Oregon State University), M.S., B.S. (Agricultural University of Athens, Greece), Professor, 2008.

Wamishe, Yesi Andenow, Ph.D. (University of Arkansas) M.S., B.S. (Addis Ababa University, Ethiopia), Associate Professor, 2011.

Courses

PLPA 5001. Seminar. 1 Hour.

Review of scientific literature and oral reports on current research in plant pathology. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

PLPA 502V. Special Problems Research. 1-6 Hour.

Original investigations of assigned problems in plant pathology. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLPA 504V. Special Topics. 1-18 Hour.

Lecture topics of current interest not covered in other courses in plant pathology or other related areas. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

PLPA 5123. Bacterial Lifestyles. 3 Hours.

The course will introduce students to bacteria as prokaryotic organisms, different from eukaryotes such as plants and animals. Model microbial systems will be studied in more detail to identify unique strategies that bacteria employ to thrive in their respective environment, whether they are causing diseases or establishing beneficial interactions with animal or plants or coexisting with other microorganisms in diverse ecological environments. The course will also cover special adaptations that bacteria have evolved to adapt to harsh environments and how these adaptations can be harnessed to control pollution. Prerequisite: (BIOL 2013 and BIOL 2011L) or BIOL 3123. (Typically offered: Spring Odd Years)

This course is cross-listed with BIOL 5223.

PLPA 5223. Plant Disease Control. 3 Hours.

(Formerly PLPA 4223.) Principles, methods and mechanics of plant disease control. Emphasis is given to the integration of control measures and epidemiology of plant diseases. Lecture 3 hours per week. Graduate degree credit will not be given for both PLPA 4223 and PLPA 5223. (Typically offered: Fall)

PLPA 5303. Advanced Plant Pathology: Host-Pathogen Interactions. 3 Hours.

Presentation of important contemporary concepts relative to disease resistance and the physiology, biochemistry, and molecular biology of plant-pathogen interactions. Lecture 3 hours per week. Prerequisite: PLPA 3003 or equivalent and graduate standing. (Typically offered: Spring Odd Years)

PLPA 5313. Advanced Plant Pathology: Ecology and Epidemiology. 3 Hours.

Presentation of important contemporary concepts relative to the ecology and epidemiology of foliar and soil-borne plant pathogens. Lecture 3 hours per week. Prerequisite: PLPA 3003 and graduate standing. (Typically offered: Spring Even Years)

PLPA 5324. Applied Plant Disease Management. 4 Hours.

(Formerly PLPA 4304.) A plant pathology course emphasizing practical understanding of the concepts and principles of agronomic and horticultural crop disease management, including disease diagnosis, monitoring, and using models to forecast disease events. Graduate degree credit will not be given for both PLPA 4304 and PLPA 5324. (Typically offered: Irregular)

PLPA 5333. Biotechnology in Agriculture. 3 Hours.

(Formerly PLPA 4333.) Discussion of the techniques, applications, and issues of biotechnology as it is being used in modern agriculture. Coverage includes the basics of molecular biology, production of transgenic plants and animals, and new applications in the agricultural, food, and medical marketplace. Lecture and discussion, 3 hours per week. Graduate degree credit will not be given for both PLPA 4333 and PLPA 5333. (Typically offered: Fall)

PLPA 5404. Diseases of Economic Crops. 4 Hours.

Diagnosis and management of important diseases of cotton, fruits, rice, trees, soybeans, wheat, and vegetables will be covered in a lecture, laboratory, and field format. Lecture 2 hours, laboratory 4 hours per week. Four 1-day field trips will be involved. Corequisite: Lab component. Prerequisite: PLPA 3003. (Typically offered: Summer)

PLPA 5603. Plant Pathogenic Fungi. 3 Hours.

Plant Pathogenic Fungi is structured as an integrated lecture/laboratory class designed for students that are interested in developing an understanding and appreciation for taxonomy, biology, and ecology of plant pathogenic fungi and related saprophytic fungi. Corequisite: Lab component. Prerequisite: PLPA 3003 or BIOL 4424 or graduate standing. (Typically offered: Fall Odd Years)

PLPA 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PLPA 6203. Plant Virology. 3 Hours.

Lecture emphasizing discussion of recent advances in plant virology. Laboratory concerned with techniques and equipment used in plant virus studies, including transmission of viruses, characterization utilizing ultracentrifugation, spectrophotometry, electrophoresis, electron microscopy, and serology. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CHEM 5813 or CHEM 5843 or CHEM 6873 or consent of instructor. (Typically offered: Fall Even Years)

PLPA 6503. Plant Bacteriology. 3 Hours.

Current concepts and techniques in plant bacteriology, including taxonomic, ecological and molecular aspects of plant pathogenic bacteria and their interactions with hosts. Lecture 2 hours, laboratory 2 hours per weeks. Corequisite: Lab component. Prerequisite: BIOL 2013 and BIOL 2011L. (Typically offered: Spring Odd Years) May be repeated for up to 3 hours of degree credit.

Political Science (PLSC)

William Schreckhise
Department Chair
428 Old Main
479-575-3356
Email: schreckw@uark.edu

Patrick Conge
Graduate Coordinator and Vice Chair
428 Old Main
479-575-3356
Email: pconge@uark.edu

Department of Political Science Website (<http://catalog.uark.edu/graduatecatalog/programsofstudy/politicalsciencedepartmentofplsc/%20http://fulbright.uark.edu/departments/political-science/>)

Degrees Conferred:

M.A. (PLSC)
J.D./M.A. (Dual Degree)
M.P.A. in Public Administration (p. 278) (PADM)
J.D./M.P.A. (p. 278) (Dual Degree)

Graduate Certificates Offered (non-degree):

Cross-Sector Alliances (p. 341). See also the Cross-Sector Alliance website (<http://catalog.uark.edu/graduatecatalog/programsofstudy/politicalsciencedepartmentofplsc/%20http://fulbright.uark.edu/departments/political-science/graduate-studies/crosssector.php>).

M.A. Areas of Study: American politics and political theory, comparative politics and international relations, and public administration.

Primary Areas of Faculty Research: American politics, comparative politics, international relations, political theory, public administration.

Political Science (PLSC)

Program Description: The M.A. degree in Political Science is designed to give students further training in selected areas of concentration within the discipline and to prepare them for careers in academe or public service.

M.A. in Political Science

Admission Requirements for the Master of Arts Degree Program:

Applicants for graduate study in political science must be admitted to the Graduate School and also meet the following requirements: 1) satisfactory GRE scores, 2) submission of a written essay, and 3) three letters of recommendation from persons competent to judge the

applicant's potential for graduate studies. Students from all academic backgrounds are encouraged to apply. Students who have had few political science courses at the undergraduate level may be required to enroll in undergraduate courses to begin their graduate studies.

Requirements for the Master of Arts Degree: The M.A. degree is a 36-semester hour program. Completion of the program is contingent upon passing a comprehensive examination or writing and defending a thesis.

Core (18 hours)**Take the following (9 hours):**

PLSC 5163	Public Policy	3
PLSC 5913	Research Methods in Political Science	3
PLSC 5943	Advanced Research Methods in Political Science	3

Take three of the following (9 hours):

PLSC 5203	Seminar in American Political Institutions	9
PLSC 5213	Seminar in American Political Behavior	
PLSC 5503	Comparative Political Analysis	
PLSC 5803	Seminar in International Politics	

Courses are offered in three areas of study: American politics, comparative politics and international relations, and public administration and policy. From these offerings, students must select a primary area of study. A minimum of 12 hours from the primary area of study must be completed, of which six hours will be accepted from the core. A secondary field of no less than six hours will complement the choices in the primary field, of which three hours will be accepted from the core. Selection of the areas of study should be commensurate with the professional or career goals of the student. A minimum of 27 hours must be fulfilled by 5000-level classes. Students must take a minimum of 30 of their 36 course hours in the Department of Political Science. The remaining hours may be taken in other departments.

Courses at the 4000 level may be taken with the graduate adviser's consent. Under special circumstances, students may arrange to take graduate-level directed readings or independent research courses. Such courses require an application that must be approved by the student's graduate adviser in concert with the professor from whom the course is to be taken. The student must apply for such a course before the semester in which the course is to be taken.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Thesis Option: Students must take 30 hours of coursework and six hours of thesis credit. Under this option, the student's comprehensive examination will be a defense of the thesis. All M.A. candidates in this option are required to develop a prospectus for their thesis. They must then write and orally defend an acceptable thesis.

Non-thesis Option: Students must take 36 semester hours of coursework. Under this option, students must take a comprehensive examination in their primary field of study.

J.D./M.A. Program

Degrees Conferred:

J.D./M.A. (Dual Degree)

fulbright.uark.edu/departments/political-science/graduate-studies/jdma-dual-degree-program/index.php (<http://fulbright.uark.edu/departments/political-science/graduate-studies/jdma-dual-degree-program/>)

The Department of Political Science, the Graduate School, and the School of Law cooperate in offering a dual degree program that allows a student to pursue the M.A. in Political Science and the J.D. degrees concurrently.

The program described below requires 36 hours as follows: the student selects a) courses from comparative politics or international relations seminars in political science or equivalent courses in other departments approved by the graduate adviser in political science (total of 18 hours: 3 hours methods and 15 hours from a combination of international relations and comparative politics seminars); b) six additional hours of PLSC classes approved by the program's graduate director or six hours of thesis credit; and c) twelve hours of elective courses taken in the law school in an area of concentration approved by the director of the M.A. program.

Students must be admitted to the M.A. program and the School of Law. If a student seeks to enter the dual degree program after enrolling in either the law school or the M.A. program, he or she must obtain admission to the other degree program during the first year of study.

The School of Law accepts 9 semester hours of M.A. courses to satisfy requirements for the J.D. degree, which can be chosen from the following courses:

PLSC 5203	Seminar in American Political Institutions	3
PLSC 5213	Seminar in American Political Behavior	3
PLSC 5253	Politics of Race and Ethnicity	3
PLSC 5503	Comparative Political Analysis	3
PLSC 5803	Seminar in International Politics	3
PLSC 5833	International Political Economy	3

The Associate Dean for Academic Affairs of the School of Law may approve new or alternative courses proposed to satisfy the requirements of the program for J.D. credit.

Students admitted to the dual degree program may commence their studies in either the law school or the M.A. program but must complete first year course requirements before taking courses in the other degree program. If they do not maintain the academic or ethical standards of either degree program, students may be terminated from the dual degree program. Students in good standing in one degree program but not in the other may be allowed to continue in the other program in which they have good standing and must meet the degree requirements of that program. If for any reason a student admitted to the dual degree program does not complete the M.A. degree, he or she cannot count nine hours of M.A. courses toward the J.D. degree. Likewise, M.A. students may not be able to count certain law courses if they decide to discontinue their studies in the law school. The J.D. will be awarded upon completion of all degree requirements; the M.A. will be awarded upon completion of the comprehensive examination and all required coursework, as well as the successful defense of a master's thesis, if applicable.

Mandatory Comprehensive Exam: All students will be required to take a written comprehensive examination covering their M.A. program or a six-hour thesis. The comprehensive exam will be graded by at least a three-person faculty committee selected by the M.A. Program Director. Students pursuing the thesis option are not required to take a written examination. Successful defense of their thesis satisfies this requirement. In addition to the successful completion of all course requirements and a passing grade on the written comprehensive examination (if taken), each student must present a minimum cumulative grade-point average of 3.00.

Thesis Option: Students pursuing the thesis option should consult the graduate coordinator of the political science department. The thesis committee must be composed of faculty members from both the School of Law and the Department of Political Science. Thesis credit is 6 hours.

Internship Option: Students may pursue an internship. Internship credit is variable and depends on the number of hours worked. Students in this option must consult with their J.D. and M.A. advisers. An internship work plan and expected academic work products will be developed.

Graduate Faculty

Adam, Thomas, Ph.D., M.A. (University of Leipzig), Associate Professor, 2020.

Baptist, Najja K., Ph.D. (Howard University), M.A. (Jackson State University), B.A. (North Carolina Central University), Assistant Professor, 2020.

Bayram, A. Burcu, Ph.D. (Ohio State University), M.I.S. (North Carolina State University), B.A. (Middle East Technical University), Assistant Professor, 2016.

Conge, Patrick J., Ph.D. (University of Texas at Austin), M.A., B.S. (Arizona State University), Associate Professor, 1995.

Crawford, Cory, J.D. (University of Arkansas), Lecturer, 2019.

Diallo, Anne B., Ph.D., M.P.A., B.A. (University of Arkansas), Lecturer, 2012.

Dowdle, Andrew J., Ph.D. (Miami University), M.A. (University of Iowa), B.A. (University of Tennessee), Professor, 2003.

Ghadbian, Najib, Ph.D. (City University of New York), M.A. (Rutgers University), M.A. (City University of New York), B.Sc. (United Arab Emirates University), Associate Professor, 1999.

Hunt, Valerie H., Ph.D., J.D., B.A. (University of Arkansas), Associate Professor, 2005.

Kelley, Donald R., Ph.D. (Indiana University at Bloomington), M.A., B.A. (University of Pittsburgh), Professor, 1980.

Kerr, Brinck, Ph.D. (Texas A&M University), B.A. (University of Texas at Austin), Professor, 1994.

Maxwell, Angie, Ph.D., M.A. (University of Texas at Austin), B.A. (University of Arkansas), Associate Professor, 2008.

Medina Vidal, D. Xavier, Ph.D. (University of California-Riverside), M.A., B.A. (University of New Mexico), Associate Professor, 2015.

Mitchell, Joshua Lee, Ph.D. (Southern Illinois University), M.P.A., B.S. (Murray State University), Associate Professor, 2010.

Moyer, Rachael M., Ph.D., M.S., M.A. (University of Arkansas), B.A. (University of Missouri-St. Louis), Lecturer, 2020.

Parry, Janine A., Ph.D., M.A. (Washington State University), B.A. (Western Washington University), Professor, 1998.

Reid, Margaret F., Ph.D. (University of Oklahoma), M.B.A. (Central State University), M.P.A. (University of Oklahoma), M.A. (University of Bonn), B.A. (University of Marburg, West Germany), Professor, 1993.

Ryan, Jeffrey J., Ph.D., M.A. (Rice University), B.A. (Colorado State University), Associate Professor, 1990.

Saeidi, Shirin, Ph.D. (University of Cambridge, United Kingdom), M.A. (George Mason University), B.A. (University of Maryland-College Park), Assistant Professor, 2018.

Schreckhise, William D., Ph.D., M.A., B.A. (Washington State University), Professor, 1998.

Sebold, Karen Denice, Ph.D., M.A. (University of Arkansas), B.S. (Campbell College), B.S. (Rogers State University), Assistant Professor, 2011.

Shields, Todd G., Ph.D., M.A. (University of Kentucky), B.A. (Miami University), Professor, 1994.

Song, Geoboo, Ph.D. (University of Oklahoma), B.A. (Korea University), B.A. (Hanyang University), Associate Professor, 2012.

Stewart, Patrick A., Ph.D., (Northern Illinois University), M.A., B.A. (University of Central Florida), Associate Professor, 2008.

Tumison, Creed, Ph.D., M.A. (University of Arkansas), B.S. (Arkansas State University), Visiting Assistant Professor, 2020.

Zeng, Ka, Ph.D. (University of Virginia), M.A. (Virginia Polytech Institute and State University), B.A. (Foreign Affairs College, Beijing), Professor, 2000.

Courses

PLSC 500V. Special Topics. 1-3 Hour.

(Formerly PLSC 400V.) Topics in political science not usually covered in other courses. Graduate degree credit will not be given for both PLSC 400V and PLSC 500V. (Typically offered: Irregular) May be repeated for degree credit.

PLSC 5043. The U.S. Constitution I. 3 Hours.

(Formerly PLSC 4253.) United States Supreme Court decisions involving the functions and powers of Congress, the Supreme Court, and the President and federalism. Graduate degree credit will not be given for both PLSC 4253 and PLSC 5043. Prerequisite: PLSC 2003. (Typically offered: Spring)

PLSC 5053. Creating Democracies. 3 Hours.

(Formerly PLSC 4513.) Analyses of the creation of democracies in Europe, South America, Asia, Africa, the Middle East, East Europe, and the former Soviet Union. Graduate degree credit will not be given for both PLSC 4513 and PLSC 5053. Prerequisite: PLSC 2013. (Typically offered: Fall Even Years)

PLSC 5083. The Middle East in World Affairs. 3 Hours.

An analysis of geo-political and socio-economic characteristics of Middle Eastern societies and their impact on world economic and political order. Special attention to such issues as the Arab-Israeli conflict, the promotion of lasting peace in the region, impact of oil on world politics, the involvement of superpowers, rehabilitation of Palestinian refugees and the role of the United Nations. (Typically offered: Spring)

PLSC 5103. Human Behavior in Complex Organizations. 3 Hours.

Review of the fundamental literature and a systematic analysis of various theories and research focusing on organization and behavior in public administration, including the discussion of organizational development, human motivation, leadership, rationality, efficiency and conflict management in public organizations. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years; Summer)

PLSC 5113. Seminar in Human Resource Management. 3 Hours.

Intensive study of public personnel policies and practices, including legal foundations, classification and compensation plans, recruitment and selection processes, training, employment policies and morale, employee relations and organization. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5123. Public Budgeting and Finance. 3 Hours.

Focuses on the budgeting process and governmental fiscal policy formulation, adoption, and execution. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5133. Nonprofit Management. 3 Hours.

This course provides an overview of the principal management functions in public and nonprofit organizations. Topics include financial management, HR development, program development. The relationships among volunteer boards of trustees, fund raising, public relations, and program personnel are analyzed, and the complex environments with service sector agencies are explored. (Typically offered: Fall)

PLSC 5143. Administrative Law. 3 Hours.

A seminar which examines the constitutional and statutory basis and authority of public organizations. Special attention focuses on the nature of the rule-making and adjudicatory powers of public agencies and on executive, legislative, and judicial restraints on such activities. Also considered are the role, scope, and place of public regulatory activities. Prerequisite: Graduate standing. (Typically offered: Spring)

PLSC 5163. Public Policy. 3 Hours.

Seminar examining the study of public policy making in complex organizations. Attention given to different theories and frameworks explaining public policy making. Prerequisite: Graduate standing. (Typically offered: Spring)

PLSC 5173. Community Development. 3 Hours.

Community development encompasses the political, social, and economic issues that shape contemporary communities. The seminar examines substantive issues in community development, related theories, and techniques. A major focus of the course will be on low-income and minority neighborhoods and efforts to create more inclusive communities in the U.S. and abroad. (Typically offered: Fall)

PLSC 5193. Seminar in Public Administration. 3 Hours.

Introduction to and synthesis of public administration theory, functions, history, public accountability and management concerns, economic impact of administrative decisions, current problems, and issues in the public sector. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5203. Seminar in American Political Institutions. 3 Hours.

Research seminar dealing with selected aspects of the major governmental institutions in the United States. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5213. Seminar in American Political Behavior. 3 Hours.

Reading seminar surveying major works on representative processes in American national politics, including political opinion, political leadership, political participation, voting behavior, political parties, and interest groups. Prerequisite: Graduate standing. (Typically offered: Spring)

PLSC 5233. The American Chief Executive. 3 Hours.

Study of the origin, background, and evolution of the Office of the President of the United States, with a review of the president's powers in the areas of politics, administration, and legislation. (Typically offered: Spring Odd Years)

PLSC 5243. Seminar in State Politics and Policy. 3 Hours.

Research seminar dealing with selected aspects of state political institutions and politics such as policy diffusion, institutional professionalization, and representation. Prerequisite: Graduate standing. (Typically offered: Fall Even Years)

PLSC 5253. Politics of Race and Ethnicity. 3 Hours.

Reviews identity, political action and concepts of political activity by minority groups, focusing on contemporary political behavior, the incorporation of minority groups into the U.S. political system. (Typically offered: Irregular)

PLSC 5273. The U.S. Constitution I. 3 Hours.

United States Supreme Court Decisions involving the functions and powers of Congress, the Supreme Court and the President and federalism. (Typically offered: Spring)

PLSC 5283. Federalism and Intergovernmental Relations. 3 Hours.

(Formerly PLSC 4283.) Analysis of changes in intergovernmental relations in the American federal system. Discussions will focus on political, economic/fiscal and administrative aspects of policy changes of the pre-and post-Reagan eras. Graduate degree credit will not be given for both PLSC 4283 and PLSC 5283. (Typically offered: Spring Even Years)

PLSC 5343. Money and Politics. 3 Hours.

Familiarizes students with the world of money and politics in the United States. Examines the function of money in elections, the legal aspects, and the consequences of the regulatory environment. Provides a means to gain analytic computer skills and a strong foundation for further study of political science. (Typically offered: Fall)

PLSC 5373. Political Communication. 3 Hours.

(Formerly PLSC 4373.) Study of the nature and function of the communication process as it operates in the political environment. Graduate degree credit will not be given for both PLSC 4373 and PLSC 5373. (Typically offered: Spring Even Years)

PLSC 5383. Seminar in Political Communication. 3 Hours.

Research seminar focusing on selected topics such as candidate imagery, diffusion of political information, or political symbolism. Prerequisite: Graduate standing. (Typically offered: Irregular)
This course is cross-listed with COMM 5383.

PLSC 5503. Comparative Political Analysis. 3 Hours.

A selection of topics to provide the theoretical, conceptual and methodological and foundation for the analysis of contemporary political systems. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5513. Seminar in Politics of the Middle East. 3 Hours.

Explores the major lines of inquiry on the politics of the state and society in the context of endogenous and exogenous forces that have influenced conceptions of power, legitimacy, and identity. Prerequisite: Graduate standing. (Typically offered: Irregular)

PLSC 5563. Government and Politics of Russia. 3 Hours.

(Formerly PLSC 4563.) Study of Russian and Soviet politics after 1917 and of the democratization of Russia and the other successor states. Graduate degree credit will not be given for both PLSC 4563 and PLSC 5563. Prerequisite: PLSC 2003 or PLSC 2013. (Typically offered: Spring Even Years)

PLSC 5583. Political Economy of East Asia. 3 Hours.

(Formerly PLSC 4583.) Development strategies and policies of major economies in East Asia. Topics include theories for East Asia's economic growth, dynamics and process of East Asian political and economic developments, strengths and limits of the East Asian development model, Asian values and their implications for Asian-style democracy, and dynamics of regional cooperation. Graduate degree credit will not be given for both PLSC 4583 and PLSC 5583. (Typically offered: Spring)

PLSC 5593. Islam and Politics. 3 Hours.

Compares contemporary Islamist political movements. Seeks to explain causes, debates, agendas, and strategies of Islamists in the political realm. Addresses sovereignty, the rule of law, visions of the good state and society, and relations between nationalism, religion and political development. Focus on Middle East with comparative reference to other cases. (Typically offered: Fall)

PLSC 5703. Research Design in Political Science and Public Policy. 3 Hours.

This course is designed to introduce graduate students to fundamental research issues in the realm of applied social science while developing the ability to apply basic skills for conducting research. (Typically offered: Fall)

PLSC 5803. Seminar in International Politics. 3 Hours.

Research seminar providing intensive coverage of selected topics in theories of international relations, the comparative study of foreign policy making, and international organizations. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5823. Qualitative Methods in Political Science. 3 Hours.

Develops expertise in qualitative research methods, including when such methods are appropriate, the benefits and drawbacks, and how to distinguish between strong and weak research questions. (Typically offered: Spring Even Years)

PLSC 5833. International Political Economy. 3 Hours.

Seminar with concentrated reading in selected and specialized areas of contemporary international relations. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5843. International Legal Order. 3 Hours.

Analysis of distinctive characteristics of contemporary international law. Topics include role of legal order in controlling the use of force in international relations and the impact of social and political environment on growth of international law and relations among international political systems. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5863. Political Psychology and International Relations. 3 Hours.

Examines psychological approaches to international relations and examines how these perspectives advance the study of world politics. (Typically offered: Irregular)

PLSC 5873. Inter-American Politics. 3 Hours.

An analysis of the political themes, regional organization, and hemispheric relations that constitute the inter-American system, with special emphasis on conflict and cooperation in the hemispheric policies of the American republics. (Typically offered: Irregular)

PLSC 5883. Politics of International Law. 3 Hours.

This course examines the interaction between law and politics in the international system, focusing on international law. (Typically offered: Irregular)

PLSC 590V. Directed Readings in Political Science. 1-3 Hour.

Directed readings in Political Science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLSC 5913. Research Methods in Political Science. 3 Hours.

Methods relevant to research in the various fields of political science. Required of all graduate students in political science. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 592V. Internship in Political Science. 1-6 Hour.

Internship in a local, state, regional, or federal agency. Paper required on a significant aspect of internship experience. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

PLSC 5943. Advanced Research Methods in Political Science. 3 Hours.

Provides a firm theoretical foundation in, and an ability to apply, various multivariate statistical methods that are most commonly used for empirical analysis of politics and policy. Prerequisite: PLSC 5913 or equivalent. (Typically offered: Fall)

PLSC 595V. Research Problems in Political Science. 1-3 Hour.

Research problems in Political Science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLSC 5983. Mixed Methods Research Design. 3 Hours.

An advanced overview of a particular type of multi-point research design. Mixed methods research combines quantitative and qualitative research strategies in a single research project. (Typically offered: Spring)

PLSC 5993. African American Political Ideology. 3 Hours.

A survey course designed to identify and examine characteristics and functions of several variants of black political ideology/thought. (Typically offered: Spring Odd Years)

PLSC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PLSC 6963. Visualizing Critical Race Theory. 3 Hours.

An examination of critical theoretical approaches to the concepts of race and racism. Students will examine the ways in which these constructs perform a critical function in the construction of race(s) and racism(s) and their relevance to visual culture. (Typically offered: Fall and Spring)

This course is cross-listed with ARED 6963, AAST 6963.

Poultry Science (POSC)

David Caldwell
Department Head and Center Director
0-114 Poultry Center
479-575-5397
Email: caldweld@uark.edu

John Marcy
Graduate Student Coordinator
0-203 Poultry Center
479-575-2211

Email: jmarcy@uark.edu

Department of Poultry Science website (<http://poultry-science.uark.edu>)

Degrees Conferred:
M.S., Ph.D. (POSC)

Primary Areas of Faculty Research: Avian parasitology, avian physiology, avian virology, food safety/microbiology, immunology, molecular biology, poultry breeding and genetics, poultry economics, poultry enterprise operations, poultry health, poultry meat quality, poultry nutrition, poultry product technology, and turkey and egg product/management.

Areas of Study: Graduate studies may be pursued in those areas of primary faculty research. Poultry and laboratory animals are available for research programs in the Poultry Science Department.

M.S. in Poultry Science

Prerequisites to Degree Program: The student pursuing a program for a Master of Science degree must meet all general requirements of the Graduate School. In addition, the student must have completed the B.S. degree in a college or university with a major or equivalent in one of the areas of the poultry science department. All applicants must submit at least three letters of recommendation and scores on the Graduate Record Examinations.

For acceptance into the Ph.D. degree program, a grade-point average of 3.00 on all previous graduate work and scores on the Graduate Record Examinations must be presented.

Requirements for the Master of Science Degree: For the M.S. degree, at least 24 hours of course work and six hours of thesis must be completed. No more than 12 hours or three courses at the 4000 level may be used for credit. A maximum of four hours of 5000 Special Problems may be used for M.S. degree requirements. At least three courses should be taken in the Poultry Science Department. At least one seminar is required for all M.S. degree candidates. A minimum GPA of 3.0 is required for the M.S. degree. All M.S. candidates must complete a thesis based on their research and pass a final comprehensive exam with emphasis on thesis research. One manuscript suitable for publication in a refereed journal is required for each M.S. candidate to graduate.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Poultry Science

Prerequisites to Degree Program: The student pursuing a program for a Master of Science degree must meet all general requirements of the Graduate School. In addition, the student must have completed the B.S. degree in a college or university with a major or equivalent in one of the areas of the poultry science department. All applicants must submit at least three letters of recommendation and scores on the Graduate Record Examinations.

For acceptance into the Ph.D. degree program, a grade-point average of 3.00 on all previous graduate work and scores on the Graduate Record Examinations must be presented.

Requirements for the Doctor of Philosophy Degree: Ph.D. candidates bypassing the M.S. degree must take at least 36 hours of course work approved by the student's advisory committee with at least 24 hours of 5000 and 6000 level course work excluding Special Problems. No more than 12 hours or three courses at the 4000 level may be used for credit.

A maximum of four hours of 5000 Special Problems can be used for the Ph.D. degree requirements. Students in the Ph.D. program who have an M.S. degree must take at least 12 hours of 5000 and 6000 level course work excluding Special Problems. If not taken previously, a three hour statistics course is required for graduation for all Ph.D. candidates. A minimum of two seminars is required of all Ph.D. candidates. All Ph.D. degree candidates must take 18 hours of dissertation research. Admission to candidacy requires the candidate to take a comprehensive written exam as determined by members of the student's Graduate Advisory Committee and a preliminary oral exam given by the Graduate Advisory Committee. Any student who fails the admission to candidacy exams will not be permitted to reschedule the exams for a six-month period. A second failure will lead to termination from the program. A final oral examination will be taken that is a defense of the dissertation. A minimum GPA of 3.0 is required for the Ph.D. degree. Two manuscripts suitable for publication in a refereed journal are required for each Ph.D. student to graduate. These papers will be evaluated by the Graduate Advisory Committee for comments and approval.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

- Alrubaye, Adnan A.**, Ph.D., M.Ed. (University of Arkansas), M.Sc. (University of Baghdad), Research Assistant Professor, 2013.
- Bottje, Walter G.**, Ph.D. (University of Illinois-Urbana-Champaign), M.S. (Southern Illinois University), B.S. (Eastern Illinois University), Professor, 1985.
- Caldwell, David J.**, Ph.D., M.S., and B.S. (Texas A&M University), Professor, 2019.
- Clark, Fred D.**, Ph.D., D.V.M., M.S., B.S. (Texas A&M University), Extension Professor, 1994.
- Coon, Craig N.**, Ph.D., M.S., B.S. (Texas A&M University), Professor, 1997.
- Donoghue, Annie**, Ph.D. (F. Edward Herbert School of Medicine), M.S. (Texas A&M University), B.S. (San Diego State University), Research Professor, 2000.
- Dridi, Sami**, Ph.D., M.S. (National Polytechnic Institute of Lorraine, France), B.S. (Superior Institute of Mateur, Tunisia), Professor, 2013.
- Erf, Gisela F.**, Ph.D. (Cornell University), M.S., B.S. (University of Guelph, Canada), Professor, 1994.
- Hanning, Casey Owens**, Ph.D., M.S., B.S. (Texas A&M University), Professor, 2000.
- Hargis, Billy M.**, Ph.D., D.V.M. (University of Minnesota-Twin Cities), M.S. (University of Georgia), B.S. (University of Minnesota), Distinguished Professor, 2000.
- Kidd, Michael T.**, Ph.D. (North Carolina State University), M.S., B.S.A. (University of Arkansas), Professor, 2010.
- Kong, Byungwhi**, Ph.D., M.S. (University of Minnesota-Twin Cities), B.S. (Korea University), Associate Professor, 2006.
- Kuenzel, Wayne J.**, Ph.D. (University of Georgia), M.S., B.S. (Bucknell University), Professor, 2000.
- Kwon, Young Min**, Ph.D. (Texas A&M University), M.S., B.S. (Seoul National University), Associate Professor, 2002.
- Marcy, John A.**, Ph.D., M.S. (Iowa State), B.S. (University of Tennessee), Extension Professor, 1993.
- Orlowski, Sara K.**, Ph.D., M.S. (University of Arkansas), B.S. (Cornell University), Assistant Professor, 2019.
- Rath, Narayan C.**, Ph.D., M.S. (University of Delhi-India), B.S. (Utkal University-India), Research Professor, 1992.
- Rochell, Samuel J.**, Ph.D. (University of Illinois at Urbana-Campaign), M.S., B.S. (Auburn University), Assistant Professor, 2016.

Sun, Xiaolun, Ph.D., M.S. (Virginia Polytech Institute and State University), B.S. (Southern China Agricultural University), Assistant Professor, 2016.

Tellez-Isaias, Guillermo, Ph.D. (Texas A&M University), Visiting Professor, 2002.

Wideman, Robert F., Ph.D. (University of Connecticut), B.A. (University of Delaware), Professor, 1993.

Courses

POSC 500V. Special Problems. 1-6 Hour.

Work in special problems of poultry industry. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

POSC 5033. Statistical Process Control in the Food Industry. 3 Hours.

(Formerly POSC 4033.) Analysis of processing data related to compliance with regulatory limits, quality and safety limits and internal and external customer specifications. Emphasizes statistical process control chart development, including understanding data and chart selection, calculating statistical limits, and interpreting process performance. Graduate degree credit will not be given for both POSC 4033 and POSC 5033. Prerequisite: Instructor consent. (Typically offered: Irregular)

POSC 510V. Special Topics in Poultry Sciences. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in poultry science. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

POSC 5113. Food Toxicology and Contaminants. 3 Hours.

During this course, the student will learn basic concepts of food toxicology, study the different physiological processes involved in food borne intoxications, and learn about potential health problems associated with exposure to these compounds. Prerequisite: Graduate study. (Typically offered: Irregular)

POSC 5123. Advanced Animal Genetics. 3 Hours.

Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: POSC 3123 or ANSC 3123. (Typically offered: Fall Even Years)
This course is cross-listed with ANSC 5123.

POSC 5143. Biochemical Nutrition. 3 Hours.

Interrelationship of nutrition and physiological chemistry; structure and metabolism of physiological significant carbohydrates, lipids, and proteins; integration of metabolism with provision of tissue fuels; specie differences in regulatory control of tissue and whole body metabolism of nutrients. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

This course is cross-listed with ANSC 5143.

POSC 5152. Protein and Amino Acid Nutrition. 2 Hours.

Students will be introduced to the basic processes of protein digestion, amino acid absorption, transport, metabolism, and utilization along with how biochemical function of proteins and their dynamic state affect nutritional status for animals and man. Prerequisite: CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with ANSC 5152.

POSC 5163. Companion Animal Nutrition. 3 Hours.

This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities.

Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring)

This course is cross-listed with ANSC 5163.

POSC 5213. Integrated Poultry Management Systems. 3 Hours.

(Formerly POSC 4213.) Major managerial systems in the integrated commercial poultry industry. Development of an understanding of the basic decision making processes of poultry companies and the factors influencing those decisions. Graduate degree credit will not be given for both POSC 4213 and POSC 5213. Prerequisite: POSC 2353 and AGEC 1103 and AGEC 2303. (Typically offered: Fall)

POSC 5233. Value Added Muscle Foods. 3 Hours.

An intense study of muscle structure and how it relates to the development of further processed meat products. Muscle ultrastructure, protein functionality, product development, and quality analysis will be covered. In class hands on activities will also be included to allow students to obtain experience of producing processed meat products. (Typically offered: Spring Even Years)

POSC 5243. Legal Issues in Animal Agriculture. 3 Hours.

(Formerly POSC 4123.) An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues. The wide range of regulation from local to state to federal, depending on the issue will be studied and discussed. Graduate degree credit will not be given for both POSC 4123 and POSC 5243. (Typically offered: Spring Odd Years)

POSC 5254. Egg and Meat Technology. 4 Hours.

(Formerly POSC 4314.) Study of the science and practice of processing poultry meat and egg products; examination of the physical, chemical, functional and microbiological characteristics of value added poultry products; factors affecting consumer acceptance and marketing of poultry products and the efficiency of production. Graduate degree credit will not be given for both POSC 4314 and POSC 5254. Corequisite: Lab component. Prerequisite: (CHEM 1123 and CHEM 1121L) or (CHEM 1073 and CHEM 1071L) and BIOL 1543 and BIOL 1541L. (Typically offered: Fall)

POSC 5313. Domestic Animal Bacteriology. 3 Hours.

A study of bacteria pathogenic for domestic animals. Lecture 3 hours per week. (Typically offered: Fall)

POSC 5333. Poultry Breeding. 3 Hours.

(Formerly POSC 4333.) Application of new developments in poultry breeding for efficient egg and meat production. Not intended for students interested in a career in veterinary sciences. Lecture 3 hours per week. Graduate degree credit will not be given for both POSC 4333 and POSC 5333. (Typically offered: Fall Odd Years)

POSC 5343. Advanced Immunology. 3 Hours.

Aspects of innate, cell-mediated, and humoral immunity in mammalian and avian species. Molecular mechanisms underlying the function of the immune system are emphasized. A course in Basic Immunology prior to enrollment in Advanced Immunology is recommended but not required. Lecture 3 hours per week. (Typically offered: Spring)

This course is cross-listed with BIOL 5343.

POSC 5352L. Immunology in the Laboratory. 2 Hours.

Laboratory course on immune-diagnostic laboratory techniques and uses of antibodies as a research tool. Included are cell isolation and characterization procedures, immunochemistry, flow cytometry, ELISA and cell culture assay systems. Laboratory 6 hours per week. Prerequisite: POSC 5343 or BIOL 5343 or BIOL 4713. (Typically offered: Spring)

This course is cross-listed with BIOL 5352L.

POSC 5443. Poultry Nutrition. 3 Hours.

(Formerly POSC 4343.) Principles of nutrition as applied to the formulation of practical chicken and turkey rations. Lecture 3 hours per week. Graduate degree credit will not be given for both POSC 4343 and POSC 5443. Prerequisite: CHEM 2613 or CHEM 3603. (Typically offered: Spring)

POSC 5742. Advanced Poultry Diseases. 2 Hours.

An in-depth coverage of the most important diseases of poultry with a focus on understanding mechanisms of pathogenesis, diagnostic techniques and principles of prevention. Lecture/discussion 2 hours per week. Prerequisite: POSC 3223. (Typically offered: Spring Odd Years)

POSC 5743L. Advanced Analytical Methods in Animal Sciences Laboratory. 3 Hours.

Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. (Typically offered: Fall)

This course is cross-listed with ANSC 5743L.

POSC 5873. Molecular Analysis of Foodborne Pathogens. 3 Hours.

Course topics will include molecular detection and identification of foodborne pathogens, the molecular response of foodborne pathogens to their environments, functional genomic approaches, and analysis of complex microbial communities. Lecture/discussion 3 hours per week. (Typically offered: Fall)

POSC 5901. Graduate Seminar. 1 Hour.

Critical review of the current scientific literature pertaining to the field of poultry science. Oral reports. Recitation 1 hour per week. Prerequisite: Senior standing. (Typically offered: Fall and Spring)

POSC 5923. Brain and Behavior. 3 Hours.

Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory and autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with ANSC 5923.

POSC 5932. Cardiovascular Physiology of Domestic Animals. 2 Hours.

Cardiovascular physiology, including mechanisms of heart function and excitation, and blood vessel mechanisms associated with the circulatory system in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall)

This course is cross-listed with ANSC 5932.

POSC 5942. Endocrine Physiology of Domestic Animals. 2 Hours.

Endocrine physiology, including mechanisms of hormone secretion, function, and regulation. Mechanisms associated with the endocrine system will be discussed for domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall)

This course is cross-listed with ANSC 5942.

POSC 5952. Respiratory Physiology of Domestic Animals. 2 Hours.

Respiratory physiology, including mechanisms of lung function and gas exchange. Mechanisms associated with the interaction of the respiratory system with other bodily systems in domestic animals and poultry will be discussed. Lecture 3 hours; drill 1 hour per week for first 8 weeks of semester. Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Spring)

This course is cross-listed with ANSC 5952.

POSC 5962. Gastrointestinal/Digestive Physiology of Domestic Animals. 2 Hours.

Gastrointestinal and hepatic physiology, including mechanisms of digestion, absorption of nutrients with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall)

This course is cross-listed with ANSC 5962.

POSC 5972. Renal Physiology of Domestic Animals. 2 Hours.

Renal physiology, including mechanisms of renal clearance with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Spring)

This course is cross-listed with ANSC 5972.

POSC 600V. Thesis. 1-6 Hour.

Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

POSC 6123. Advanced Food Animal Wellbeing. 3 Hours.

Advances in fundamentals of animal welfare including animal health, animal handling, food safety and productivity. Prerequisite: Instructor consent. (Typically offered: Spring)

This course is cross-listed with ANSC 6123.

POSC 6343. Vitamin Nutrition in Domestic Animals. 3 Hours.

The vitamins required by domestic animals with emphasis upon their role in animal nutrition, physiological functions, and consequences of failure to meet the requirement of the animal. Lecture 3 hours per week. Prerequisite: (ANSC 3143 or POSC 4343) and CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with ANSC 6343.

POSC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Psychological Science (PSYC)

Doug Behrend
Department Chair
216 Memorial Hall
479-575-4256

James Lampinen
Associate Chair
216 Memorial Hall
479-575-4256

Email for Clinical Psychology program: ctcgrad@uark.edu
Email for Experimental Psychology program: etcgrad@uark.edu

Psychological Science Website (<http://fulbright.uark.edu/departments/psychological-science/>)

Degrees Conferred:

M.A., Ph.D. (PSYC) (Note: The department does not offer a terminal master's degree.)

Areas of Study: The degree of Doctor of Philosophy is offered in the fields of experimental psychology and clinical psychology. The program is designed to produce experimental and clinical psychologists with broad knowledge of the field. Specialization for research is required during the student's last two years of study.

Program Description: The Experimental Training Program is designed to provide the basic skills and an approach to scientific investigation that will allow the graduate to engage in research in any of several broad areas. In addition to this broad training, the program provides specialty training in the subareas of social, cognitive, and developmental psychology, as well as in neuroscience. The faculty and students typically have their primary research programs within one of these subareas, although collaboration is common across these areas. Students in the Experimental Training Program are trained to have excellent statistical and writing skills, to become competent and autonomous researchers, and to contribute to the field of psychology through presentations at professional conferences and publications in scholarly journals. Opportunities for extensive supervised teaching experience are also available to our students. Graduates of the Experimental Training Program typically obtain teaching and academic positions after graduation, while others take jobs in the private sector.

The Ph.D. program in Clinical Psychology follows the scientist/practitioner model of training. Although some of our graduates obtain applied, direct service provision positions, our training curriculum is such that those students whose career aspirations have been directed toward academic and research positions also have been successful. The Clinical Training Program is based on the premise that clinical psychologists should be skilled practitioners and mental health service providers as well as competent researchers. To facilitate these goals, we strive to maximize the match between the clinical and research interests of the faculty with those of the graduate students. The academic courses and clinical experiences are designed to promote the development in both areas. The objective of the Clinical Training Program is to graduate clinical psychologists capable of applying psychological theory, research methodology, and clinical skills to complex clinical problems and diverse populations. The program is fully accredited by the American Psychological Association.

Primary Areas of Faculty Research: The faculty in the Department of Psychological Science engage in research ranging from memory to child psychology to emotion and more. Find out more about individual faculty member's interests at the Psychological Science faculty page (<http://fulbright.uark.edu/departments/psychological-science/people/>).

M.A. in Psychology

Prerequisites to Degree Program: The candidate for admission to graduate study in psychology must satisfy the requirements of the Graduate School and have the approval of the Admission Committee of the appropriate training program. Scores on the Graduate Record Examination General Tests must be submitted with the application. The student normally will be expected to have had at least 18 semester hours in psychology, including statistics and research methods, or their equivalents.

The program of study is designed primarily for the student who seeks the Ph.D. degree. Students interested in pursuing a terminal master's degree should not apply for admission. However, all Ph.D. candidates must complete requirements for the M.A. degree.

Requirements for the Master of Arts Degree:

Clinical— minimum 30 hours. A student who seeks only the Master of Arts degree will be advised on selection of courses that will meet specific objectives. The student must complete 24 semester hours of course work and submit a research thesis. The thesis should be finished no later than the end of the second year of study.

Experimental— minimum 30 hours. A student who seeks only the Master of Arts degree must complete 24 hours of courses, including the following required courses:

PSYC 5223	Perception	3
PSYC 5013	Advanced Developmental Psychology	3
PSYC 5063	Advanced Social Psychology	3
PSYC 5113	Theories of Learning	3
PSYC 5123	Cognitive Psychology	3
PSYC 5143	Advanced Descriptive Statistics for Psychology	3
PSYC 523V	Research Practicum	2
PSYC 6133	Advanced Behavioral Neuroscience	3

In addition, the student must submit a research thesis.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Psychology

Prerequisites to Degree Program: The candidate for admission to graduate study in psychology must satisfy the requirements of the Graduate School and have the approval of the Admission Committee of the appropriate training program. Scores on the Graduate Record Examination General Tests must be submitted with the application. The student normally will be expected to have had at least 18 semester hours in psychology, including statistics and research methods, or their equivalents.

The program of study is designed primarily for the student who seeks the Ph.D. degree. Students interested in pursuing a terminal master's degree should not apply for admission. However, all Ph.D. candidates must complete requirements for the M.A. degree.

Requirements for the Doctor of Philosophy Degree:

1. Students in the experimental psychology program must fulfill all the requirements for the Master of Arts degree and take four 6000-level experimental psychology seminars.
2. Clinical students who do not have a course in History and Systems prior to enrolling in the program will need to present evidence of having completed a course on this topic either at the University of Arkansas or another institution with a grade of B or above prior to degree completion. In addition, the clinical students must take the following required courses:

PSYC 5013	Advanced Developmental Psychology	3
PSYC 5033	Psychopathology Theory & Assessment	3
PSYC 5043	Assessment of Intellectual and Cognitive Abilities	3
PSYC 5063	Advanced Social Psychology	3
PSYC 5313	Introduction to Clinical Science: Research Design and Ethical Guidelines	3
PSYC 5073	Introduction to Clinical Practice: Core Skills and Ethical Guidelines	3
PSYC 5113	Theories of Learning	3
PSYC 5133	Inferential Statistics for Psychology	3
PSYC 5143	Advanced Descriptive Statistics for Psychology	3
PSYC 5163	Personality: Theory & Assessment	3
PSYC 6133	Advanced Behavioral Neuroscience	3

PSYC 6163	Psychotherapy	3
PSYC 6213	Psychotherapy Outcomes	3

3. The clinical student must take a clinical practicum (PSYC 607V) each semester on campus and three electives as described in the Departmental Handbook (<https://fulbright.uark.edu/departments/psychological-science/forms-and-resources/>). The student must complete a one-year pre-doctoral internship at an approved facility. It may precede or follow completion of the dissertation at the discretion of the advisory committee, but it must be completed prior to formal granting of the degree.

4. All students must pass a written candidacy examination at a time recommended by the student's advisory committee.

5. All students must complete a dissertation demonstrating independent scholarship and originality in research and its oral defense.

The candidacy examination focuses upon methods characteristic of the field and upon specific content areas that are appropriate for each student. This examination may not be given until the M.A. thesis has been accepted, and it must be completed before dissertation research is begun. The final oral examination deals primarily with the dissertation research.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Faculty

Behrend, Douglas A., Ph.D. (University of Minnesota), B.A. (Kalamazoo College), Professor, 1989.

Beike, Denise R., Ph.D., B.A. (Indiana University), Professor, 1995.

Bridges, Ana Julia, Ph.D. (University of Rhode Island), M.S. (Illinois State University), B.S. (University of Illinois-Urbana-Champaign), Professor, 2007.

Cavell, Timothy A., Ph.D. (Louisiana State University), M.S. (Texas A&M University), B.A. (Louisiana State University), Professor, 2002.

Chapman, Kate M., Ph.D., M.S. (Penn State University), B.A. (New Florida College), Teaching Assistant Professor, 2016.

Ditzfeld, Christopher, M.S. (University of Oklahoma), Instructor, 2011.

Eidelman, Scott H., Ph.D. (University of Kansas), B.A. (University of Wisconsin-Madison), Associate Professor, 2008.

Feldner, Matthew T., Ph.D. (University of Vermont), M.A. (West Virginia University), B.S. (University of Wisconsin-Stevens Point), Professor, 2005.

Ham-Holm, Lindsay S., Ph.D., M.A., B.A. (University of Nebraska-Lincoln), Associate Professor, 2007.

Judah, Matt, Ph.D., M.S. (Oklahoma State University), B.A. (Ozark Christian College), Assistant Professor, 2020.

Lamm, Connie, Ph.D., M.A. (University of Toronto, Canada), B.A. (University of Waterloo), Assistant Professor, 2016.

Lampinen, James Michael, Ph.D., M.S. (Northwestern University), B.S. (Elmhurst College), Distinguished Professor, 1998.

Leen-Feldner, Ellen Winifred, Ph.D. (University of Vermont), M.A. (West Virginia University), B.A. (University of Notre Dame), Professor, 2005.

Leong, Josiah, Ph.D. (Stanford University), B.A. (University of California, Berkeley), Assistant Professor, 2020.

Levine, William H., Ph.D., M.S. (State University of New York at Binghamton), B.S. (DePaul University), Associate Professor, 2001.

Makhanova, Anatasia, Ph.D. (Florida State University), B.A. (Hendrix College), Assistant Professor, 2019.

Petretic, Patricia Ann Louise, Ph.D., M.A. (Bowling Green State University), B.A. (Youngstown State University), Associate Professor, 1990.

Quetsch, Lauren, Ph.D., M.A. (West Virginia University), B.A. (University of Missouri), Assistant Professor, 2019.

Shields, Grant, Ph.D., M.A. (University of California, Davis), B.A. (Simpson College), Assistant Professor, 2020.

Steinmetz, Joseph E., Ph.D. (Ohio University), M.A., B.S. (Central Michigan University), Distinguished Professor of Psychological and Brain Science, 2016.

Vargas, Ivan, Ph.D. (University of Michigan), B.S. (Notre Dame University), Assistant Professor, 2019.

Veilleux, Jennifer Celene, Ph.D., M.A. (University of Illinois at Chicago), B.A. (Macalaster College), Associate Professor, 2011.

Zabelina, Darya, Ph.D. (Northwestern University), Assistant Professor, 2017.

Zamboanga, Byron L., Ph.D., M.A. (University of Nebraska), B.A. (University of California, Berkeley), Professor, 2020.

Zies, Brenda June, Ph.D., M.A. (University of Arkansas), B.S. (East Texas State University), Teaching Assistant Professor, 2005.

Courses

PSYC 5013. Advanced Developmental Psychology. 3 Hours.

Critical examination of the research relevant to the psychological factors influencing the growth processes of the individual from birth to maturity. (Typically offered: Spring)

PSYC 5033. Psychopathology Theory & Assessment. 3 Hours.

Psychological and somatic factors contributing to pathological behavior. Interrelations of these factors will be analyzed in terms of how they lead to differential abnormal states. Includes guidelines for using structured interviews in the diagnosis and clinical assessment of major psychological disorders. Prerequisite: PSYC 3023 and enrollment in the Graduate Program in Psychology, or instructor consent. (Typically offered: Fall)

PSYC 5043. Assessment of Intellectual and Cognitive Abilities. 3 Hours.

Training in the theory, administration and interpretation of individual tests of intelligence and mental ability. Prerequisite: PSYC 4053 and enrollment in the Psychology Graduate Program. (Typically offered: Fall)

PSYC 5063. Advanced Social Psychology. 3 Hours.

Theory, methodology, and contemporary research in the major areas of social psychology. Topics include attitude theory and measurement, group processes, social and cultural factors. (Typically offered: Spring)

PSYC 5073. Introduction to Clinical Practice: Core Skills and Ethical Guidelines. 3 Hours.

An introduction to clinical practice focusing on a) interview methods and techniques and b) ethical principles and guidelines. Includes an introduction to clinic policies and procedures. Prerequisite: Enrollment in the Psychology graduate program. (Typically offered: Spring)

PSYC 5080. Observational Practicum. 0 Hours.

Observation of senior therapists in the provision of psychodiagnostic and psychotherapeutic techniques. Pre- or Corequisite: Doctoral students only. (Typically offered: Fall, Spring and Summer) May be repeated for up to 0 hours of degree credit.

PSYC 5113. Theories of Learning. 3 Hours.

Major concepts in each of the important theories of learning. (Typically offered: Fall)

PSYC 5123. Cognitive Psychology. 3 Hours.

Contemporary theories and research on human information processing including topics such as memory, language, thinking, and problem solving. (Typically offered: Spring Even Years)

PSYC 5133. Inferential Statistics for Psychology. 3 Hours.

Inferential statistics, including representative parametric tests of significance. Special emphasis on analysis of variance, covariance, and component variance estimators as applied to psychological research. Prerequisite: PSYC 2013. (Typically offered: Fall)

PSYC 5143. Advanced Descriptive Statistics for Psychology. 3 Hours.

Special correlation techniques followed by a survey of representative nonparametric tests of significance. Major emphasis on advanced analysis of variance theory and designs. Prerequisite: PSYC 5133. (Typically offered: Spring)

PSYC 5153. Advanced History and Systems of Psychology. 3 Hours.

Advanced examination of the concepts, methods, and systems which have contributed to the development of modern psychology. (Typically offered: Fall)

PSYC 5163. Personality: Theory & Assessment. 3 Hours.

An introduction to empirically based theories of personality and personality disorders with an emphasis on standardized instruments in the assessment of normative and pathological personality. Includes training in the interpretation, integration, and reporting of results. Pre- or Corequisite: PSYC 5043. Prerequisite: Enrollment in the Psychology graduate program or instructor consent. (Typically offered: Spring)

PSYC 5173. Structural Equation Modeling. 3 Hours.

Introduction to concepts and methods of structural equation modeling. Major emphasis on advanced techniques to model latent variables using large sample survey data. Prerequisite: PSYC 5133 and PSYC 5143. Corequisite: Lab component. (Typically offered: Spring Even Years)

PSYC 5223. Perception. 3 Hours.

(Formerly PSYC 4123.) Theories and representative research in the areas of sensation and perception. Graduate degree credit will not be given for both PSYC 4123 and PSYC 5223. Prerequisite: Six hours of psychology, not including PSYC 2013. (Typically offered: Irregular)

PSYC 523V. Research Practicum. 1-3 Hour.

Presentation, evaluation, and discussion of on-going research proposals. Required of all experimental graduate students in the first 2 years of their program. (Typically offered: Fall and Spring)

PSYC 5313. Introduction to Clinical Science: Research Design and Ethical Guidelines. 3 Hours.

Provides a) guidelines for designing and conducting empirical research in clinical psychology, b) ethical principles that regulate clinical research, and c) supervised opportunities to develop a clinical research proposal. Prerequisite: Enrollment in the Psychology graduate program. (Typically offered: Fall)

PSYC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 602V. Seminar: Teaching Psychology. 1-3 Hour.

Survey of the literature on teaching of psychology in college. Includes: planning the course, method, examining and advising students. Prerequisite: Teaching assistant. (Typically offered: Fall and Spring)

PSYC 607V. Clinical Practicum III. 1-3 Hour.

Provides supervised experience in the application of the more complex and lesser known psychodiagnostic techniques and training and experience in psychotherapeutic techniques with the more severe functional disorders, with special topics in these domains emphasized across sections. Prerequisite: PSYC 5073; Enrollment in the Psychology graduate program. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 609V. Clinical Graduate Seminar. 1-3 Hour.

Provides intensive coverage of specialized clinical topics. Open to all graduate students. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

PSYC 611V. Individual Research. 1-18 Hour.

Individual research. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

PSYC 6133. Advanced Behavioral Neuroscience. 3 Hours.

Examination of the biological basis of behavior, with emphasis on underlying neural mechanisms. (Typically offered: Fall)

PSYC 6163. Psychotherapy. 3 Hours.

A conceptual overview of psychotherapy, with emphasis on a) common mechanisms, and b) cognitive, affective, and interpersonal approaches. Prerequisite: PSYC 5033. (Typically offered: Fall)

PSYC 6213. Psychotherapy Outcomes. 3 Hours.

Provides a critical evaluation of theory and research on empirically supported programs and interventions for major psychological disorders. Prerequisite: Enrollment in the Psychology graduate program. (Typically offered: Spring)

PSYC 6323. Seminar in Developmental Psychology. 3 Hours.

Discussion of selected topics in the area of human development. Emphasis will be on a review of current theory and empirical research. Topics selected for discussion could range from early development (child psychology), to later development (psychology of adulthood and aging-gerontology), to current attempts to integrate the field (life-span developmental psychology). (Typically offered: Fall Odd Years)

PSYC 6343. Seminar in Quantitative Methods. 3 Hours.

Discussion of selected mathematical approaches to theorizing and research in psychology. Emphasis will be on generalization of a given approach across several content areas of psychology. Hence, while each area must be treated in reasonable depth, current thinking and research spanning more than one content area will be stressed. (Typically offered: Irregular)

PSYC 6353. Seminar in Learning/Memory/Cognition. 3 Hours.

Discussion of selected topics in learning, memory, or cognition. Emphasis on current theory and empirical research. Topics selected for discussion may be in the areas of learning, memory, problem solving, or language. (Typically offered: Spring Odd Years)

PSYC 6373. Seminar in Personality and Social Psychology. 3 Hours.

Discussion of selected topics in social psychology and personality. Current theoretical positions and recent research findings are emphasized. Topics selected for discussion will be in areas of intrapersonal processes, interpersonal processes, group processes or any of various areas of personality. (Typically offered: Fall)

PSYC 6413. Seminar in Physiological Psychology. 3 Hours.

Discussion of selected topics in physiological psychology. Emphasis will be on a review of current theory and empirical research. Each offering of the seminar will examine the biological basis of a specific aspect of behavior, utilizing both animal and human data. (Typically offered: Spring Odd Years)

PSYC 698V. Field Work. 1-3 Hour.

Provides academic credit for field work in multidisciplinary setting, involving supervised experiences in assessment and psychotherapy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 699V. Clinical Psychology Internship. 1-3 Hour.

Supervised experience in a multidisciplinary setting of assessment and psychotherapy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Public Administration and Nonprofit Studies (PADM)

William Schreckhise

Department Chair, Political Science

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Pat Conge

Graduate Coordinator

428 Old Main
479-575-6434
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Master of Public Administration Program Page (<http://fulbright.uark.edu/departments/political-science/graduate-studies/mpa-program/>)

Degree Offered:

M.P.A. in Public Administration and Nonprofit Studies (PADM)

Program Description: The Master of Public Administration program is administered by the Department of Political Science. The major objectives of the program are as follows:

1. To provide a broad flexible program to prepare students for careers in public service and nonprofit management;
2. To afford opportunities to practicing administrators for improving their careers and services through advanced education and training; and
3. To prepare scholars for further graduate study in the field of public administration.

A dual degree program leading to a Master of Public Administration and a Juris Doctor is also available in collaboration with the School of Law.

M.P.A. in Public Administration

Admission to the M.P.A. Degree Program:

1. Admission to the Graduate School
2. Minimum scores of 155 on the verbal portion and 145 on the quantitative portions of the current Graduate Record Examinations (GRE). (GRE scores may be waived under certain circumstances at the discretion of the PLSC Admissions Committee. Examples of possible exceptions include the successful completion of a master's degree or the submission of GMAT or LSAT scores in lieu of GRE scores).
3. 3.20 minimum grade-point average in the last 60 hours of undergraduate coursework.
4. A written essay, submitted in accordance with standards set by the PLSC Admissions Committee.
5. Three letters of recommendation from persons competent to judge the applicant's academic/work experience.
6. Academic prerequisites: the PLSC Admissions Committee may require appropriate coursework related to an understanding of governmental processes and activities to cover deficiencies in past education.
7. All requirements listed above must be completed and reported before the beginning of the student's second semester or the student will not be admitted to courses that semester.

Requirements for the Master of Public Administration Degree: The M.P.A. requires a total of 36-39 semester hours of which 27 hours are to be 5000-level courses or above.

Required Courses (18 hours)

PLSC 5113	Seminar in Human Resource Management	3
PLSC 5123	Public Budgeting and Finance	3
PLSC 5163	Public Policy	3
PLSC 5193	Seminar in Public Administration	3
PADM 5803	Quantitative Methods Analysis	3
PADM 5913	Policy Analysis: Theory and Practice	3
Select one course from the following:		3-6

PADM 589V Independent Research (MPA Portfolio)

PLSC 600V Master's Thesis

Select two courses from the following:

6

PLSC 5283 Federalism and Intergovernmental Relations

PLSC 5103 Human Behavior in Complex Organizations

PLSC 5133 Nonprofit Management

PLSC 5143 Administrative Law

PLSC 5173 Community Development

PLSC 5243 Seminar in State Politics and Policy

PADM 5813 Managing Information Technologies in Public Affairs

PADM 5823 Grant Writing for the Social Sciences

PADM 5903 Risk and Public Policy

Special Interest Areas: A minimum of 9 or 12 graduate semester hours, depending on the student's career status when admitted to the program, may be chosen in PLSC/PADM and other disciplines with approval of the Graduate Coordinator. The Graduate Coordinator, in consultation with the student, will develop a set of relevant graduate courses that will help the student in meeting career objectives. Focused studies may be developed for students interested in fields such as community development, environmental policy and sustainability, health services administration, higher education administration, non-profit management, public policy analysis, and recreation and tourism. Other focused studies may be exercised with the consent, advice and approval of the Graduate Coordinator.

Professional Development/Internship: (1-6 semester hours). The professional development/internship is recommended but not required. The number of semester credit hours depends on the length and full/part-time nature of the internship. A maximum of six professional development/internship credit hours may be applied toward the credit hours required for special interest area coursework.

All students must either pass a portfolio exam (production and oral defense of a professional portfolio) or successfully complete six hours of thesis.

Portfolio Exam Option: Students must produce a complete portfolio comprised of at least 3 separate written artifacts for examination near the end of the M.P.A. program covering relevant content and acquired skills and knowledge unless they choose a thesis option. Students will develop their portfolio artifacts through a total of 3 credit-hours of graduate independent research (i.e., PADM 589V) by taking a 1-hour independent research during their final 3 semesters of the program under the guidance of the appropriate faculty members. A comprehensive examination of the completed portfolio will be assessed by a faculty committee composed of no fewer than three members.

Thesis Option: Students wishing to exercise the thesis option should consult with the graduate coordinator of the Department of Political Science. The thesis committee must be composed of at least three faculty members. The chair and another faculty members must be Political Science faculty. Thesis credit is 6 hours and may be counted toward the credit hours required for special interest area coursework. Students may not apply both internship and thesis hours to the credit hours required for special interest area coursework.

J.D./M.P.A. Program

Degrees Conferred:

J.D./M.P.A. (Dual Degree)

fulbright.uark.edu/departments/political-science/graduate-studies/jdmpa-dual-degree-program/index.php (<http://fulbright.uark.edu/departments/political-science/graduate-studies/jdmpa-dual-degree-program/>)

The Department of Political Science, the Graduate School, and the School of Law cooperate in offering a dual degree program that allows a student to pursue the M.P.A. and the J.D. degrees concurrently. Students must be admitted to the M.P.A. program and the School of Law. If a student seeks to enter the dual degree program after enrolling in either the law school or the M.P.A. program, he/she must obtain admission to the other degree program during the first year of study.

The School of Law accepts nine semester hours of M.P.A. courses to satisfy requirements for the J.D. degree. Fifteen hours of law school courses may be counted toward the M.P.A. degree. To qualify for J.D. credit, the M.P.A. courses must come from a set of core courses and must be approved by the law school. Students must earn a grade of "B" or higher in any M.P.A. courses offered for credit toward the J.D. For purposes of the M.P.A. degree, fifteen hours of elective courses may be taken in the law school, provided they are not required for the J.D. degree and are in an area of concentration approved by the director of the M.P.A. program.

Students admitted to the dual degree program may commence their studies in either the law school or the M.P.A. program but must complete first year course requirements before taking courses in the other degree program. If they do not maintain the academic or ethical standards of either degree program, students can be terminated from the dual degree program. Students in good standing in one degree program but not in the other may be allowed to continue in the other program in which they have good standing and must meet the degree requirements of that program. If for any reason a student admitted to the dual degree program does not complete the M.P.A. degree, he/she cannot count nine hours of M.P.A. courses toward the J.D. degree. Likewise, M.P.A. students may not be able to count certain law courses if they decide to discontinue their studies in the law school. The J.D. will be awarded upon completion of all degree requirements; the M.P.A. will be awarded upon completion of the comprehensive examination and the internship (and internship report), or alternatively, six hours of additional coursework.

Mandatory Comprehensive Exam: All students will be required to take a written comprehensive examination covering their M.P.A. program. This exam will be graded by at least a three-person faculty committee selected by the M.P.A. Program Director. Students pursuing the thesis option are not required to take a written examination. Rather, successful defense of their thesis satisfies this requirement. In addition to the successful completion of all course requirements and a passing grade on the written comprehensive examination, each student must present a minimum cumulative grade-point average of 3.00. Students enrolled in law classes that are counted towards their M.P.A. degree cannot make a grade lower than a "C." However, these courses will not be counted against the Graduate School GPA.

Thesis Option: Students pursuing the thesis option should consult with the graduate coordinator of the Political Science Department. The thesis committee must be composed of faculty members from both the School of Law and the Department of Political Science. Thesis credit is six hours.

Internships: Students may pursue an internship. Internship credit is variable and depends on the number of hours worked. Students wanting

internship credit must consult with the M.P.A. adviser who will develop an internship work plan and explain expected academic work products.

- Bayram, A. Burcu**, Ph.D. (Ohio State University), M.I.S. (North Carolina State University), B.A. (Middle East Technical University), Assistant Professor, Department of Political Science, 2016.
- Conge, Patrick J.**, Ph.D. (University of Texas at Austin), M.A., B.S. (Arizona State University), Associate Professor, Department of Political Science, 1995.
- Diallo, Anne B.**, Ph.D., M.P.A., B.A. (University of Arkansas), Lecturer, Department of Political Science, 2012.
- Dowdle, Andrew J.**, Ph.D. (Miami University), M.A. (University of Iowa), B.A. (University of Tennessee), Professor, Department of Political Science, 2003.
- Ghadbian, Najib**, Ph.D. (City University of New York), M.A. (Rutgers University), M.A. (City University of New York), B.Sc. (United Arab Emirates University), Associate Professor, Department of Political Science, 1999.
- Hunt, Valerie H.**, Ph.D., J.D., B.A. (University of Arkansas), Associate Professor, Department of Political Science, 2005.
- Kelley, Donald R.**, Ph.D. (Indiana University at Bloomington), M.A., B.A. (University of Pittsburgh), Professor, Department of Political Science, 1980.
- Kerr, Brinck**, Ph.D. (Texas A&M University), B.A. (University of Texas at Austin), Professor, Department of Political Science, 1994.
- Maxwell, Angie**, Ph.D., M.A. (University of Texas at Austin), B.A. (University of Arkansas), Associate Professor, Department of Political Science, 2008.
- Medina Vidal, D. Xavier**, Ph.D. (University of California-Riverside), M.A., B.A. (University of New Mexico), Associate Professor, Department of Political Science, 2015.
- Mitchell, Joshua Lee**, Ph.D. (Southern Illinois University), M.P.A., B.S. (Murray State University), Associate Professor, Department of Political Science, 2010.
- Parry, Janine A.**, Ph.D., M.A. (Washington State University), B.A. (Western Washington University), Professor, Department of Political Science, 1998.
- Reid, Margaret F.**, Ph.D. (University of Oklahoma), M.B.A. (Central State University), M.P.A. (University of Oklahoma), M.A. (University of Bonn), B.A. (University of Marburg, West Germany), Professor, Department of Political Science, 1993.
- Ryan, Jeffrey J.**, Ph.D., M.A. (Rice University), B.A. (Colorado State University), Associate Professor, Department of Political Science, 1990.
- Schreckhise, William D.**, Ph.D., M.A., B.A. (Washington State University), Professor, Department of Political Science, 1998.
- Sebold, Karen Denice**, Ph.D., M.A. (University of Arkansas), B.S. (Campbell College), B.S. (Rogers State University), Assistant Professor, Department of Political Science, 2011.
- Shields, Todd G.**, Ph.D., M.A. (University of Kentucky), B.A. (Miami University), Professor, Department of Political Science, 1994.
- Song, Geoboo**, Ph.D. (University of Oklahoma), B.A. (Korea University), B.A. (Hanyang University), Associate Professor, Department of Political Science, 2012.
- Stewart, Patrick A.**, Ph.D., (Northern Illinois University), M.A., B.A. (University of Central Florida), Associate Professor, Department of Political Science, 2008.
- Zeng, Ka**, Ph.D. (University of Virginia), M.A. (Virginia Polytech Institute and State University), B.A. (Foreign Affairs College, Beijing), Professor, Department of Political Science, 2000.

Courses

PADM 5803. Quantitative Methods Analysis. 3 Hours.

Data analysis techniques, including descriptive and inferential statistics and packaged computer programs. Prerequisite: Graduate standing. (Typically offered: Fall)

PADM 5813. Managing Information Technologies in Public Affairs. 3 Hours.

Examines digital interactions between citizens, institutions, and political interests from the perspective of analysts, civic leaders, and professional non-technical administrators. Explores timely issues related to public information transactions, ethics and best practices of public information management, and the strategic positioning of public information assets. Prerequisite: Graduate standing. (Typically offered: Spring)

PADM 5823. Grant Writing for the Social Sciences. 3 Hours.

This course will teach students the fundamentals of obtaining grants from local, state and federal agencies. (Typically offered: Irregular)

PADM 5833. Urban Planning. 3 Hours.

Reviews the many forms, functions, and purposes of American cities. Covers basic planning theories, surveys the various sub-fields of planning, discusses trends in the planning field, and utilizes computer simulations. (Typically offered: Fall)

This course is cross-listed with PLSC 4103.

PADM 5853. Performance Measurement in the Public and Nonprofit Sectors. 3 Hours.

Provides a hands-on approach for measuring organizational performance and using performance information of decision making. Addresses components and key issues of performance measurement, such as steps in the measurement process, methods of data gathering, and analysis. Prerequisite: PLSC 5193. (Typically offered: Summer)

PADM 5863. Issues in Public and Nonprofit Management. 3 Hours.

Explores current developments and themes in the theory and practice of public and nonprofit management. Covers a range of contemporary issues in the field, such as managing collaborative networks, e-government, and managing for results. Emerging trends are intensively discussed at the juncture of theory and practice. (Typically offered: Spring)

PADM 587V. Professional Development. 1-6 Hour.

Encompasses internships, professional projects if individual is employed full-time and not eligible for an internship, conference and workshop participation, and other activities conducive to the students development as a public service professional. (Typically offered: Fall, Spring and Summer)

PADM 588V. Directed Readings. 1-3 Hour.

Directed readings. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

PADM 589V. Independent Research. 1-3 Hour.

Independent Research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

PADM 5903. Risk and Public Policy. 3 Hours.

Examines how concepts of risk serve to justify and shape public policies and risk management practices. (Typically offered: Spring)

PADM 5913. Policy Analysis: Theory and Practice. 3 Hours.

Provides a firm theoretical foundation in, and an ability to apply, the general instruments necessary for professional practice of policy analysis. (Typically offered: Fall)

Public Policy (PUBP)

Brinck Kerr
Director
428 Old Main
479-575-3356

Email: jbkerr@uark.edu

Valerie H. Hunt
Associate Director
213 Gearhart Hall
479-575-3826
Email: vhunt@uark.edu (vhunt@uark.edu)

Public Policy Website (<http://policy.uark.edu/>)

Degree Conferred:

Ph.D. in Public Policy (PUBP)

Program Description: This interdisciplinary policy program has a strong emphasis on public affairs and will train policy leaders to directly address the policy issues of the people of Arkansas, the region, and the nation. The program provides a vehicle for the consideration of policy issues by students, faculty, and the larger community. Therefore, students and faculty will participate in colloquia, projects, and research that contribute to successful public policy. Leadership and administrative skills are included in the course of study, along with a strong emphasis on policy analysis that recognizes the complex nature of policy problems. Such an analytical approach will prepare students for work with governmental, educational, professional, and private sector experts who must cooperate in shaping public policy.

Primary Areas of Faculty Research: Faculty research areas include agricultural policy, community development and recreation policy, education policy, family policy, health policy, policy studies in aging, and public policy management, among others. Students interested in other areas policy should contact the program.

Ph.D. in Public Policy with Agricultural Policy Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
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PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4
Methods		
ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6
Electives in area of concentration, 12 hours: See program director for concentration requirements.		12
PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy, students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Agricultural Policy Concentration

Course of study (12 hours)

Specific courses will be selected in consultation between the student and the student's curriculum committee. Examples of appropriate courses are:

AGEC 5233	Political Economy of Agriculture and Food
AGEC 5153	The Economics of Public Policy

Through a special arrangement with the Law School, students may take courses in the Law School that are relevant to agricultural policy.

Ph.D. in Public Policy with Community Development and Recreation Policy Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the

doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4
Methods		
ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6
Electives in area of concentration, 12 hours: See program director for concentration requirements.		12
PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy, students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Community Development and Recreation Policy

Course of study (12 hours)

Specific courses will be selected in consultation between the student and the student's curriculum committee. Examples of appropriate courses are:

PUBP 604V	Special Topics in Public Policy	1-6
PLSC 5173	Community Development	3
SOCI 5133	The Community	3

Ph.D. in Public Policy with Education Policy Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4

Methods

ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6

Electives in area of concentration, 12 hours: See program director for concentration requirements.

PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy, students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Education Policy Concentration

Course of Study (12 hours)

Students electing the Education Policy concentration must complete a minimum of twelve graduate semester-hour credits including the following: EDFD 5683 Issues in Educational Policy.

Completion of the following course:

- HIED 5083 History and Philosophy of Higher Education

A minimum of six hours of committee-approved elective course work related to legal, governance, or administrative policy issues, from the following areas:

- Educational Administration (K-12 education)
- Higher Education (post-secondary education)

Ph.D. in Public Policy with Health Policy Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on

the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4
Methods		
ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6
Electives in area of concentration, 12 hours: See program director for concentration requirements.		12
PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy, students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Health Policy Concentration

Course of Study (12 Hours)

This concentration requires twelve hours of post masters studies. The following two courses must be taken by all Ph.D. students in order to satisfy the requirements of the concentration:

PBHL 699V	Seminar	1-6
PBHL 5633	Health Services Administration	3

The following courses, or their equivalents, must be taken. However, if any of these courses, or their equivalent, have been taken during the master's program, electives will be selected to comprise the remaining six concentration hours needed for the Ph.D. in Policy:

PBHL 5613	Epidemiology	
PBHL 5633	Health Services Administration	

Other Elective Courses

It will be the responsibility of the student's program committee to assist in selecting appropriate electives when necessary. Through a special arrangement with the Law School, students may take up to two law courses.

Ph.D. in Public Policy with Policy Studies in Aging Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4
Methods		
ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6
Electives in area of concentration, 12 hours: See program director for concentration requirements.		12
PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy,

students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Policy Studies in Aging Concentration

Course of Study (12 hours)

Required course work for the concentration include:

HDFS 5023	Critical Issues in Aging	3
CDIS 699V	Seminar in Communication Sciences and Disorders	3

Six hours to be selected from the following with the approval of the student's curriculum committee: 6

PBHL 5563	Public Health: Practices and Planning	
PBHL 5633	Health Services Administration	
PBHL 6733	Health and the Aging Process	
HDFS 5403	Family Theories and Methods	
CNED 6243	Disability Policy in the U.S.	

With the approval of the curriculum committee, other courses may be selected, depending on the student's area of interest.

Ph.D. in Public Policy with Public Policy Management Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4
Methods		
ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6
Electives in area of concentration, 12 hours: See program director for concentration requirements.		12
PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy, students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Public Policy Management Concentration

Course of Study (12 hours)

Specific courses will be selected in consultation between the student and the student's curriculum committee. Examples of appropriate course are:

PLSC 5103	Human Behavior in Complex Organizations	3
PLSC 5113	Seminar in Human Resource Management	3
PLSC 5133	Nonprofit Management	3
PBHL 5633	Health Services Administration	3
HIED 5073	Management of Higher Education Institutions	3
PADM 5823	Grant Writing for the Social Sciences	3

Requirements for Ph.D. in Public Policy with Social Justice Concentration

Areas of Concentrations: Agricultural Policy, Community Development and Recreation Policy, Education Policy, Family Policy, Health Policy, Policy Studies in Aging, Public Policy Management, Social Justice. (Other areas of concentration are possible. Contact us for more information.)

Admission Requirements for Degree Program: Applicants must have a master's degree or equivalent completed prior to beginning the doctoral program. The master's degree should be relevant to the policy area of their concentration. For example, students with a master's in geology might enter the agriculture policy concentration but not the family policy concentration. If students enroll in classes designated to address deficiencies, they may enter a concentration outside of their master's area. These decisions will be made by the program faculty. An application should include identification of the applicant's objectives and supportive background information including three letters of recommendation evaluating the applicant's ability to successfully pursue a Ph.D. A GPA of at least a 3.20 on a 4-point scale for all graduate course work is required. Scores from the verbal and quantitative portions of the Graduate Record Examination (GRE) must be submitted. GRE scores may not be more than five years old. Admission is competitive and based on the specialization and availability of an appropriate faculty mentor. Two students with identical packets may receive different decisions.

Requirements for the Doctor of Philosophy Degree: In addition to the general requirements of the Graduate School, the doctoral program consists of a minimum of 65 hours including:

Core Requirements

PUBP 6001	Pro-Seminar	1
PUBP 6013	Theories of Public Policy	3
SOCI 5133	The Community (or equivalent course)	3
Economics and Policy (3 hours selected from approved courses)		3
PUBP 6023	Law and Public Policy	3
PUBP 6103	Policy Planning, Implementation, and Evaluation	3
PUBP 6113	Agenda Setting and Policy Formulation	3
PUBP 6134	Capstone Seminar in Public Policy	4
Methods		
ESRM 6533	Qualitative Research (or equivalent course)	3
Quantitative Methods (3 hours selected from approved courses)		3
Advanced Research Methods (6 hours selected from approved courses)		6
Electives in area of concentration, 12 hours: See program director for concentration requirements.		12
PUBP 700V	Doctoral Dissertation	18
Total Hours		65

After completing approximately two years of graduate study, and at least one year before completing all other requirements, the prospective candidate must take candidacy examinations covering core and concentration studies as well as research methods. The examinations will be both written and oral. After having been admitted to candidacy, students will be required to successfully defend a dissertation proposal in front of their dissertation committee. All students must demonstrate a capacity for research by writing an original dissertation on a topic in their area of concentration. The student's final examination will be an oral defense of the dissertation.

Students should also be aware that the program in public policy has a residency policy. Students shall have met the residency requirement in the public policy Ph.D. program if they make satisfactory progress including positive residency evaluations in their annual review.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Requirements for Social Justice Concentration

This concentration requires 12 hours of post-master's studies selected from the list below, in consultation with the advisory committee: 12

PUBP 604V	Special Topics in Public Policy (1-6 hours)	
PUBP 612V	Research Problems in Policy (1-6 hours)	
SOCI 5113	Seminar in Social Inequality	
SOCI 503V	Special Topics (3-6 hours)	
PLSC 5253	Politics of Race and Ethnicity	
LAWW 6323	Poverty Law: Theory and Practice	
Total Hours		12

Bustamante, Juan Jose, Ph.D. (Michigan State University), M.S., B.A. (University of Texas Pan American), Associate Professor, Department of Sociology and Criminology, 2012.

Christy, Kameri, Ph.D., M.S.W. (University of Kansas), B.A. (University of Missouri-Kansas City), Professor, School of Social Work, 2003.

Collins, Kathleen, Ph.D., M.A., B.A. (University of California-Santa Barbara), Professor, Department of Curriculum and Instruction, 2002.

Durand-Morat, Alvaro, Ph.D., M.S. (University of Arkansas), B.S.E. (National University of Entre Rios), Assistant Professor, Department of Agricultural Economics and Agribusiness, 2016.

Ferguson, Alishia Juanelle, Ph.D., M.S., B.A. (University of Texas Arlington), Clinical Assistant Professor, School of Social Work, 2008.

Goering, Christian Z., Ph.D., M.S. (Kansas State University), B.A. (Washburn University), Professor, Department of Curriculum and Instruction, 2007.

Holyfield, Lori C., Ph.D. (University of Georgia), M.A., B.S.E. (University of Arkansas), Professor, Department of Sociology and Criminology, 1995.

Huang, Qiqiong, Ph.D. (University of California-Davis), B.S. (Remin University of China), Professor, Department of Agricultural Economics and Agribusiness, 2013.

Johnson-Carter, Charlene M., Ph.D. (Emory University), M.B.A. (Atlanta University), M.Ed., B.A. (University of Cincinnati), Associate Professor, Department of Curriculum and Instruction, 1992.

Kippenbrock, Thomas A., Ed.D. (Indiana University at Bloomington), M.S. (Indiana University-Purdue University-Indianapolis), B.S.N. (Indiana State University), Professor, Eleanor Mann School of Nursing, 2003.

Kovacs, Kent F., Ph.D. (University of California-Davis), B.A. (Vassar College), Associate Professor, Department of Agricultural Economics and Agribusiness, 2012.

Patton, Susan Kane, Ph.D., M.S.N. (University of Arkansas), M.H.S.A. (University of Arkansas at Little Rock), B.S.N. (University of Arkansas for Medical Sciences), Assistant Professor, Eleanor Mann School of Nursing, 2010.

Rainey, Daniel V., Ph.D., M.S. (Purdue University), B.S.A. (University of Arkansas), Associate Professor, Department of Agricultural Economics and Agribusiness, 2000.

Shobe, Marcia A., Ph.D. (University of Kansas), M.S.W. (University of Hawaii at Manoa), B.A. (State University of New York at Plattsburgh), Professor, School of Social Work, 2007.

Sloan, Kathryn Ann, Ph.D., M.A., M.B.A. (University of Kansas), B.A. (Kansas State University), Professor, Department of History, 2004.

Smith, Tom E.C., Ed.D. (Texas Tech University), M.Ed., B.S.E. (University of Mississippi), University Professor, Department of Curriculum and Instruction, 2002.

Turner, Ronna L., Ph.D. (University of Illinois-Urbana-Champaign), M.S.E. (Missouri State University), B.S.E. (Southwest Missouri State University), Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 1997.

Wicks, Jan L., Ph.D., M.A. (Michigan State University), B.A. (University of Southwest Louisiana), Professor, School of Journalism and Strategic Media, 1994.

Wicks, Robert Howard, Ph.D. (Michigan State University), M.A. (University of Missouri-Columbia), B.A. (American University), Professor, Department of Communication, 1994.

Zajicek, Anna, Ph.D. (Virginia Polytechnic Institute and State University), M.S., B.S. (University of Silesia, Poland), Professor, Department of Sociology and Criminology, 1994.

Courses

PUBP 6001. Pro-Seminar. 1 Hour.

An introduction to the field of public policy and to the program. The seminar will address topics such as the meaning of public policy, policy research, the dissertation process, and particular issues of public policy concern. Prerequisite: Admission to program. (Typically offered: Fall)

PUBP 6013. Theories of Public Policy. 3 Hours.

This seminar introduces doctoral students to the major concepts, frameworks, and theories of public policy. Emphasis is on the usefulness and limitations of these frameworks and theories in empirical research. Prerequisite: Graduate standing. (Typically offered: Fall)

PUBP 6023. Law and Public Policy. 3 Hours.

This course focuses on the legal aspects of public policy, with emphasis on the regulatory process and its legal constraints. Also considered are the process of administrative decision making, judicial review, legislative oversight, and public access to government information. (Typically offered: Spring)

PUBP 6033. Community Development Policy and Practice. 3 Hours.

This course examines multiple community development definitions, the community capitals framework as well as theories, conceptual frameworks and processes and how these are linked, both historically and currently, to broad-based US public policy and specifically, housing and workforce development policies. (Typically offered: Summer)

PUBP 604V. Special Topics in Public Policy. 1-6 Hour.

Designed to cover specialized topics not usually presented in depth in regular courses. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

PUBP 6103. Policy Planning, Implementation, and Evaluation. 3 Hours.

This interdisciplinary seminar will explore the relationship between policy, public administration, and organizations in the community. Stakeholder groups will be considered as part of the newer approaches to practice-driven scholarship. The class will examine innovative approaches to decision making, strategic management and policy leadership in complex interorganizational and interagency settings. (Typically offered: Irregular)

PUBP 6113. Agenda Setting and Policy Formulation. 3 Hours.

Introduces agenda and policy formation focusing on the classic theoretical and empirical literature. The course is designed to introduce graduate students to a variety of theories typologies, concepts, and ideas relating to the study of public policy. (Typically offered: Fall)

PUBP 612V. Research Problems in Policy. 1-6 Hour.

Research problems. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PUBP 6134. Capstone Seminar in Public Policy. 4 Hours.

This course is intended to integrate various policy interests in a specific community based project. Prerequisite: Instructor permission required. (Typically offered: Fall and Spring)

PUBP 6143. Mixed Method Research Design. 3 Hours.

Mixed method research is a multi-point research strategy that combines quantitative and qualitative research strategies into a single research project. (Typically offered: Irregular)

PUBP 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Recreation and Sport Management (RESM)

Matthew S. Ganio
Department Head
306 HPER Building
479-575-2857
Email: msganio@uark.edu

Paul Calleja
Assistant Department Head
306C HPER Building
479-575-2854
Email: pcallej@uark.edu

Health, Human Performance and Recreation Website

Degrees Conferred:

M.Ed. in Recreation and Sport Management (RESM)

Program Description: The Recreation and Sport Management program prepares students with the necessary competencies to pursue career opportunities primarily in intercollegiate athletic administration, but also more generally in public recreation administration, commercial recreation, sport management, community recreation, and outdoor recreation either in private or public sectors, including university settings. A minimum of 36 credit hours is required for the M.Ed. degree.

M.Ed. in Recreation and Sport Management

Prerequisites to Degree Program: For acceptance to the master's degree programs, the program area requires, in addition to the general requirements for admission to the Graduate School, an undergraduate degree in recreation or sport management (or a related field) and the following admission standards: preference is given to students with a 3.20 GPA on the last 60 hours of undergraduate course work (or cumulative); a combined GRE score of 290 or higher; and submission of a current resume and statement of interest.

Requirements for the Master of Education Degree: Candidates for a Master of Education degree in Recreation and Sport Management must complete 30 semester hours of graduate course work and 6 hours of thesis or 36 semester hours without a thesis. In addition to the program requirements listed below, all candidates must successfully complete a written comprehensive examination, except those completing a thesis.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Recreation and Sport Management:(36 hours)

Required Research Component

ESRM 5393	Statistics in Education and Health Professions	3
HHPR 5353	Research in Health, Human Performance and Recreation	3

Required Courses		
RESM 5293	Athletics and Higher Education	3
RESM 5813	Social Issues in Sport	3
RESM 5873	Leadership in Recreation and Sport Management Services	3
RESM 5853	Capstone in Recreation and Sport Management	3
RESM 5883	Recreation and Sport Services Promotion	3
RESM 5893	Public and Private Finance in Recreation and Sport Management	3
RESM 6533	Legal and Political Aspects	3
Thesis Option		
RESM 600V	Master's Thesis	6
Approved Elective		3
Non-Thesis Option		
Approved Electives		9
Total Hours		36

Area of Study: The program prepares qualified students for professional competence and service in the area of recreation and sport management.

Courses

RESM 5023. Outdoor Adventure Leadership. 3 Hours.

(Formerly RESM 4023.) This course considers the values and scope of outdoor recreation programs, leadership and skill development with practical experience in a wilderness environment. The course will include a canoe trip through the wilderness, and skill training in such areas as orienteering and rock climbing; and leadership development in interpersonal and processing skills. The graduate portion of the class is geared toward leading and trip planning for taking college age and older students into remote areas. Graduate degree credit will not be given for both RESM 4023 and RESM 5023. (Typically offered: Summer)

RESM 5273. The Intramural Sports Program. 3 Hours.

(Formerly RESM 4273.) Historical development, aim and objectives, organization, administration, units of competition, program of activities, schedule making, scoring plans, rules and regulations, awards, and special administrative problems. Graduate degree credit will not be given for both RESM 4273 and RESM 5273. (Typically offered: Fall Odd Years)

RESM 5283. History and Application of American Sport. 3 Hours.

This survey course will explore the historical development of sport in American culture and the processes of change in American culture and sport from the 15th century to the present. Students will learn how to apply historical concepts to current issues in recreation and sport management. (Typically offered: Irregular)

RESM 5293. Athletics and Higher Education. 3 Hours.

This course features an examination of the historical development of athletics within American institutions of higher learning with an emphasis upon concepts and ideals that underlie the developments and the major problems affecting contemporary intercollegiate athletics. The purpose of this course is to teach the learner about the development of intercollegiate athletics from the mid-19th century to today. A second purpose of this course is to examine the major issues facing sport administrators within intercollegiate athletics today. (Typically offered: Spring and Summer)

RESM 5333. Sport Media and Public Relations. 3 Hours.

The course will explore the relationship between media organizations and sport organizations, with an emphasis on the business of media rights, as well as public relations theories such as two-way symmetrical communication and agenda setting. Finally, the course will examine practical communication tactics employed by public relations practitioners such as image repair and crisis communications, and the issues presented by forms of new media. (Typically offered: Fall)

RESM 5463. Sports Facilities Management. 3 Hours.

Considers basic elements and procedures in the planning, design, construction, operation, and maintenance of sport facilities; management considerations in conducting various types of events. (Typically offered: Summer)

RESM 560V. Workshop. 1-3 Hour.

Workshop. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

RESM 574V. Internship. 1-3 Hour.

This experiential-based course requires 135 hours per semester of work in a recreation or sport setting. (Typically offered: Fall, Spring and Summer)

RESM 5813. Social Issues in Sport. 3 Hours.

Using sociological theories and scholarship to examine social and cultural influences on sport and physical activity. Course is based on a social justice framework and a cultural studies perspective. (Typically offered: Fall and Summer)

RESM 5833. Recreation and Sport for Special Populations. 3 Hours.

Skills, knowledge, and concepts within recreation and sport which are appropriate to planning and implementing recreation and sport programs and services for the handicapped. (Typically offered: Irregular)

RESM 5843. Tourism. 3 Hours.

Explores major concepts of tourism to discover what makes tourism work, how tourism is organized, and its social and economic effects. (Typically offered: Spring)

RESM 5853. Capstone in Recreation and Sport Management. 3 Hours.

Capstone course where students utilize program courses to solve administrative issues which may arise in an organization. Attention is given to how departmental organization, administrative practices and policies, strategic planning, personnel management, finances, and legal areas are integrated to create solutions to broad-based contemporary issues. (Typically offered: Spring)

RESM 5873. Leadership in Recreation and Sport Management Services. 3 Hours.

Considers research, theory, and practical applications of leadership principles utilized in the provision of recreation and sport management services. Focus is on motivation, attitude, communication, group dynamics, and problem solving. (Typically offered: Fall and Summer)

RESM 5883. Recreation and Sport Services Promotion. 3 Hours.

Examines specific strategies for promoting recreation and sport programs in the local community. (Typically offered: Summer)

RESM 5893. Public and Private Finance in Recreation and Sport Management. 3 Hours.

Develops an understanding of both public and private finance management for students in public and private management positions. Provides an understanding of the budgeting processes and techniques used in obtaining and controlling funds, including private sector finance problems in areas of credit, pricing, indexing, and debt management. (Typically offered: Fall)

RESM 600V. Master's Thesis. 1-18 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

RESM 605V. Independent Study. 1-3 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

RESM 612V. Directed Reading in Recreation and Sport. 1-3 Hour.

Critical analysis of literature in the area of recreation and sport. (Typically offered: Fall, Spring and Summer)

RESM 6133. Issues in RESM. 3 Hours.

A review of the significant social, demographic, behavioral, developmental, and technological issues that influence health, kinesiology, and recreation and sport management programs. Pre- or Corequisite: Doctoral level students only. (Typically offered: Irregular)

RESM 6533. Legal and Political Aspects. 3 Hours.

An overview of major legislation affecting recreation and sport management professions; how to operate within these laws; and methods for influencing new legislation. Also discusses political aspects of professions both outside and inside government agencies. (Typically offered: Spring)

RESM 674V. Internship. 1-3 Hour.

Students will learn diverse teaching techniques and implement them in an ongoing undergraduate recreation and sport management class serving as the teaching laboratory. The 'what' 'when' and 'how' relative to integrating various teaching techniques with specific content areas in the class will be explored by both the student and the instructor. (Typically offered: Fall, Spring and Summer)

Rehabilitation, Human Resources and Communication Disorders (RHRC)

Michael Hevel
Department Head
100 Graduate Education Building
479-575-4924
Email: hevel@uark.edu

Rehabilitation, Human Resources and Communication Disorders website
(<http://rhrc.uark.edu/>)

Degrees Conferred:

M.Ed., Ed.D. in Adult and Lifelong Learning (p. 13) (ADLL)
M.Ed. in Community College Leadership (p. 75) (CCLE)
M.Ed., Ed.D. in Higher Education (p. 161) (HIED)
M.Ed., Ed.D. in Human Resource and Workforce Development (p. 178) (HRWD)
M.S. in Communication Sciences and Disorders (p. 72) (CDIS)
M.S. in Counseling (p. 90) (CNSL)
Ph.D. in Counselor Education (p. 90) (CNED)
Ph.D. in Educational Statistics and Research Methods (p. 116) (ESRM)

Certificates Offered (non-degree)

Advanced School-Based Speech Language Pathology (p. 335) (ASLPMC)
Educational Measurement (p. 116) (EDMEMC)
Educational Program Evaluation (p. 116) (EDEVMC)
Educational Psychology (p. 116) (EDPSMC)
Educational Statistics and Research Methods (p. 116) (EDSTMC)

Primary Areas of Faculty Research: Faculty in the Department of Rehabilitation, Human Resources and Communication Disorders are engaged in research activities specific to their program areas. These range from bullying behaviors in elementary school and community college leadership to swallowing disorders and human resource management. Contact individual faculty members or visit the departmental website (<http://rhrc.uark.edu/>) for more information about research in the department.

Graduate Faculty

Adams, Justin J., Ph.D. (University of South Carolina, M.Ed., B.A. (Winthrop University), Assistant Professor, 2018.
Aslin, Larry W., M.A., B.A. (University of Missouri-Columbia), Instructor, 1975.
Baker, Barry, J.D. (University of Arkansas), Lecturer, .
Biggs, Bobbie T., Ph.D. (Texas A&M University), M.S., B.S. (University of Arkansas), Professor, 1979.

Blisard, Paul, Ed.D. (University of Arkansas), M.C., B.S., B.S. (Southwest Missouri State University), Clinical Assistant Professor, 2014.
Bowers, Andrew L., Ph.D. (University of Tennessee Health Science Center), M.A., B.A. (University of Tennessee), Associate Professor, 2012.
Bowers, Lisa Marie, Ph.D. (University of Tennessee Health Science Center), M.A., B.A. (Louisiana State University), Associate Professor, 2012.
Camargo, Elsa, Ph.D. (Virginia Polytechnic Institute and State University), M.A., B.A. (University of Illinois at Chicago), Assistant Professor, 2018.
Cao, Chunhua, Ph.D. (University of South Florida-Tampa), Teaching Assistant Professor, 2019.
Christian, David, Ph.D., M.S. (University of North Texas), B.A. (University of Texas at Dallas), Assistant Professor, 2015.
Dieffenderfer, Vicki, Ph.D., M.S., B.S. (University of Tennessee), Clinical Assistant Professor, 2015.
Frazier, Kimberly Frances, Ph.D. (University of South Carolina-Columbia), M.S., B.S.E. (University of Arkansas), Associate Professor, 2007.
Gearhart, G. David, Ed.D., J.D. (University of Arkansas), B.A. (Westminster College), Professor, 1998.
Gibson, Tracy, Ed.D. (University of Arkansas), Lecturer, 2019.
Gilbertson, Margie, Ph.D. (University of Memphis), M.S.E., B.A. (University of Central Arkansas), Clinical Instructor, 2016.
Glade, Rachel E., Ph.D. (University of Arkansas), M.S. (University of Arkansas for Medical Sciences), M.A. (University of Arkansas), B.S. (University of Arkansas at Little Rock), Assistant Professor, 2015.
Grover, Kenda Shea, Ed.D. (University of Arkansas), M.S., B.A. (Northeastern State University), Associate Professor, 2003.
Haghighi, Mohammad, Ph.D. (Ohio University), Assistant Professor, 2019.
Hagstrom, Fran W., Ph.D. (Clark University), M.S. (University of Texas Health Science Center-Houston), M.A. (St. Louis University), B.A. (Southwest Baptist University), Associate Professor, 2002.
Hevel, Michael Stephen, Ph.D. (University of Iowa), M.A. (Bowling Green State University), B.A. (University of Kansas), Associate Professor, 2012.
Higgins, Kristin Kay, Ph.D., M.S. (University of Arkansas), B.A. (Vanderbilt University), Associate Professor, 2006.
Holyfield, Christine E., Ph.D. (Pennsylvania State University), M.A. (University of Kansas), B.S. (Central Michigan University), Assistant Professor, 2017.
Kacirek, Kit, Ed.D., M.Ed. (University of Arkansas), B.S. (University of Texas), Associate Professor, 1997.
Koch, Lynn C., Ph.D. (University of Wisconsin-Madison), M.S., B.S. (University of Arizona), Professor, 2006.
Liang, Xinya, Ph.D. (Florida State University), B.S. (Zhejiang Gongshang University, China), Assistant Professor, 2014.
Lo, Wen-Juo, Ph.D., M.A. (Arizona State University), B.S. (Soochow University), Associate Professor, 2008.
Maddox, Robert F., Ph.D. (University of Nebraska), Instructor, 2019.
Mamiseishvili, Ketevan, Ph.D., M.A. (University of Missouri-Columbia), B.A. (Akaki Tsereteli State University), Professor, 2008.
McCray, Suzanne, Ph.D. (University of Tennessee), M.A., B.A. (University of Arkansas), Associate Professor, 2010.
Miller, Michael T., Ed.D. (University of Nebraska), M.S., B.A. (Southern Illinois University), Professor, 2003.
Murry, John, Ed.D., J.D., M.B.A., B.S.B.A., B.S. (University of Arkansas), Associate Professor, 1993.
Perry, Kim, M.S. (University of Arkansas), Instructor, 2007.
Perryman, Kristi Leann, Ph.D. (University of Arkansas), M.S., B.S. (Southwest Missouri State University), Assistant Professor, 2014.

Popejoy, Erin O., Ph.D. (University of Texas–San Antonio), M.A. (Texas State University), B.A. (Case Western Reserve University), Assistant Professor, 2015.

Ray, Teresa, Ph.D. (Capella University), Instructor, 2019.

Roessger, Kevin, Ph.D., M.S., B.A. (University of Wisconsin-Milwaukee), Associate Professor, 2016.

Sadeghi, Ali M., M.S. (University of Arkansas), Lecturer, 2019.

Shelton, Leslie Jo, Ph.D. (Michigan State University), M.Ed., B.A. (Ohio University), Assistant Professor, 2014.

Shoge, Kendra E., M.S. (Missouri State University), Lecturer, 2019.

Shull, Wanda, Ph.D. (University of Arkansas), Lecturer, 2019.

Turner, Ronna L., Ph.D. (University of Illinois-Urbana-Champaign), M.S.E. (Missouri State University), B.S.E. (Southwest Missouri State University), Professor, 1997.

Vajda, Anthony J., Ph.D. (Old Dominion University), M.S. (La Salle University), B.A. (University of Delaware), Assistant Professor, 2018.

Williams, Brent Thomas, Ph.D. (University of Illinois, Urbana-Champaign), M.S. (University of Texas Southwestern Medical School), B.A. (Austin College), Associate Professor, 2002.

Winkle, Allison P., M.S. (University of Arkansas), Lecturer, 2019.

Adult and Lifelong Learning Courses

ADLL 5113. Perspectives in Adult Education. 3 Hours.

Historical overview of the evolving field of adult education and lifelong learning in responsibilities of adult education providers and reviews the expansion of adult and lifelong learning opportunities associated with societal and demographic shifts. (Typically offered: Fall and Spring)

ADLL 5123. Principles and Practices of Adult Learning. 3 Hours.

Overview of the adult learner including characteristics, motivation for participating in learning, and strategies for developing educational programs for diverse adult populations. (Typically offered: Fall and Summer)

ADLL 5133. Curriculum Development in ABE and ASE. 3 Hours.

Curriculum development in Adult Basic Education (ABE) and Adult Secondary Education (ASE) settings including the various educational functioning levels, measures to assess student levels, selection of teaching materials, and development of curriculum utilizing instructional standards for ABE and ASE programs. (Typically offered: Fall)

ADLL 5143. Instructional Strategies and Assessment in Adult Education. 3 Hours.

Selection and utilization of materials and instructional methods for use in adult learning settings. Evaluative strategies to develop or select appropriate tools and techniques predicated upon the needs and goals of adult learners. (Typically offered: Spring)

ADLL 5153. Organization and Administration of Adult and Lifelong Learning Programs. 3 Hours.

Legal, ethical, staffing, and financial considerations for the development and implementation of programs for adult and lifelong learners in various programs including literacy centers, GED centers, community education, lifelong/leisure learning, and postsecondary education. (Typically offered: Spring)

ADLL 5163. Managing Change in Adult and Lifelong Learning. 3 Hours.

Strategies for planning, organizing, and facilitating change in programs that serve adult learners from diverse populations, across varied developmental stages and geographic locations. Discussion of social change that has impacted adult education and analysis of change models relevant to individuals, groups and organizations. (Typically offered: Fall and Summer)

ADLL 5173. Program Planning. 3 Hours.

Program development process for adult and lifelong learners. Overview of assessment, developing program objectives, identifying resources, and designing program plans. (Typically offered: Summer)

ADLL 5183. Technology and Innovation in Adult Learning. 3 Hours.

Techniques for designing, developing, implementing, and assessing technology-mediated adult and lifelong learning programs. Discussion of issues relevant to the use of innovative strategies for delivering instruction via emerging technologies and their potential impact on content and learning outcomes. (Typically offered: Summer)

ADLL 5193. Seminar in Adult and Lifelong Learning. 3 Hours.

Seminars focused on topics related to adult and lifelong learning. (Typically offered: Spring and Summer)

ADLL 5213. Adult and Lifelong Learning Internship. 3 Hours.

Internship in adult and lifelong learning settings. (Typically offered: Fall and Spring)

ADLL 5223. Adult and Lifelong Learning Applied Project. 3 Hours.

Development and Implementation of a project focused on adult and lifelong learning. Consent of advisor/instructor required. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

ADLL 5233. Independent Study. 3 Hours.

Provides students with an opportunity to pursue special study in adult and lifelong learning. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ADLL 6113. Advanced Adult Learning Theory. 3 Hours.

Advanced study of theories and models of adult and lifelong learning with an emphasis on current trends, recent research, and issues affecting the field. Issues covered will include critical theory and advancements in neuroscience and cognition as they relate to adult learning and lifespan development. (Typically offered: Irregular)

ADLL 6123. Leadership and Ethics in Adult and Lifelong Learning. 3 Hours.

This doctoral course focuses on leadership principles and ethical considerations that are critical to developing and sustaining adult education programs that benefit individuals, organizations, and communities. Course content will include case study analysis and lectures from scholar-practitioners from the field. (Typically offered: Irregular)

ADLL 6133. Analysis of International Adult and Lifelong Programs. 3 Hours.

Survey of the historical and philosophical events which have shaped adult and lifelong learning worldwide. Discussion of issues affecting adult education and lifelong learning including globalization, educational access, and variance in national policies. (Typically offered: Irregular)

ADLL 6143. Instructional Adaptation and Innovation in Adult and Lifelong Learning. 3 Hours.

An overview of teaching and learning methods, styles, and techniques which are applicable when facilitating adult learners across diverse settings. Content to include teaching and learning style assessment, accommodating learning styles, physical and learning disabilities, language differences and cultural norms. (Typically offered: Irregular)

ADLL 6153. Policy and Public Governance of Adult and Lifelong Learning Programs. 3 Hours.

Policy analysis and public governance issues in adult and lifelong learning with emphasis on state and federal programs. Discussions of how to evaluate, design, and implement policy focused on promoting adult and lifelong learning activities in a myriad of organizations. Overview of trends and current issues related to policy and public governance of adult and lifelong learning. (Typically offered: Irregular)

ADLL 6173. Current Issues. 3 Hours.

Exploration and discussion of current issues relative to adult education and lifelong learning. Focus on the review and application of current research as it relates to practice. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ADLL 6183. Organization Development, Learning, and Change. 3 Hours.

Using a system perspective, this course examines the theories and practices associated with organization development, learning and change to understand the dynamic nature of organizational life. This course examines the structural frame, the human resource frame, the political frame, and the symbolic frame that influences organizational behavior and learning. The course investigates strategies and best practices for managing and leveraging this dynamism to build organizational capacity and improve performance. (Typically offered: Fall and Spring)

ADLL 6213. Signature Pedagogy: Teaching and Learning in Community Colleges. 3 Hours.

Using a learning-centered change model, this course examines how community colleges can shift from a traditional teaching-centered paradigm to one that is learning-centered. This course examines the context of the learning college, strategic planning for a learning-outcomes approach to governance, the role of student development and technology in the learning college, and implementing and assessing learning-centered strategies. (Typically offered: Irregular)

ADLL 6223. Workforce and Community Development. 3 Hours.

This course provides an overview of how community colleges influence workforce, economic, and community development through their education missions. The course will examine the community college's expanding role in economic and community development through workforce development programs. Emphasis will be placed on program structure, best practices in program development, and partnerships and collaboration with various stakeholders. (Typically offered: Irregular)

ADLL 6233. Survey and Significance of the American Community College. 3 Hours.

A comprehensive overview of the American community college, its history, its ever-evolving purpose and the challenges it faces. Course content will focus on the administrators and faculty who lead, the students they serve, and components such as developmental education, integrative education and transfer education. Discussion will include occupational and community education and issues related to accountability. Special attention will be paid to how this unique and complex institution remains relevant and significant to the community. (Typically offered: Irregular)

ADLL 6243. Current Trends in Community Colleges. 3 Hours.

This course examines environmental factors that influence the organization and administration of community colleges. Trends related to funding, policy, staffing, and workforce development are examined and contextualized to the evolving community college mission. (Typically offered: Irregular)

ADLL 6253. Professional Development in Adult and Lifelong Learning. 3 Hours.

This course examines career planning and development, performance management, and professional development in various settings. The focus of the course will be on concepts associated with Human Resource Development (HRD) and developing employees within an organization, as well as leading adults in transition in the community and in educational settings through the process of making career decisions. (Typically offered: Irregular)

ADLL 6313. Independent Study. 3 Hours.

Independent study of topics in adult and lifelong learning. (Typically offered: Irregular)

ADLL 6403. Quantitative Reasoning I for Adult Educators. 3 Hours.

Introduction to quantitative reasoning for educators and researchers in adult education. Topics include applying the hypothetico-deductive research process, describing data using statistical terminology, building statistical models, presenting data meaningfully, and using SPSS to analyze data from practical research problems. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. (Typically offered: Fall and Spring)

ADLL 6413. Quantitative Reasoning II in Adult and Lifelong Learning. 3 Hours.

Methodologies for designing descriptive, correlational, and experimental studies. Development of research questions, definition of variables, selection or development of instruments, data collection, analysis, interpretation and reporting of research results. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or equivalent. (Typically offered: Fall)

ADLL 6423. Qualitative Reasoning in Adult and Lifelong Learning. 3 Hours.

Methodologies for designing qualitative research studies in adult and lifelong learning settings. Selection of the appropriate qualitative tradition, selection of research subjects, development of data collection protocols, field work strategies, data analysis, data interpretation and presentation of data results. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. (Typically offered: Spring)

ADLL 6433. Program Evaluation. 3 Hours.

Overview of evaluation strategies in adult and lifelong learning programs that include: development of evaluation questions, selection or development of instrumentation, data collection methods, data analysis, and reporting of evaluation results. Emphasis on practical and ethical issues associated with evaluation processes. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or ADLL 6413 or ADLL 6423, or equivalent. (Typically offered: Spring)

ADLL 6443. Adult and Lifelong Learning Dissertation Seminar. 3 Hours.

Development of dissertation proposal. Formation of research question, selection of methodologies, development of problem statement, research questions, and identification of research variables, constructs of phenomena. Identification of data collection and data analysis procedures. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or ADLL 6413 or ADLL 6423 or ADLL 6433, or equivalent. (Typically offered: Spring)

ADLL 6463. Advanced Qualitative Reasoning in Adult and Lifelong Learning. 3 Hours.

This qualitative methods course provides students with advanced instruction in qualitative data collection, field observations, records research, data analysis, and data display. In addition to reviewing various research studies that demonstrate different qualitative research approaches, students will practice some of the activities associated with executing a qualitative research study. Prerequisite: ADLL 6423 or instructor consent. (Typically offered: Irregular)

ADLL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Communication Sciences and Disorders Courses

CDIS 5103. Research Methodology in Communication Disorders. 3 Hours.

An examination of methods of research in speech-language pathology and audiology and of the use of bibliographic tools. Focuses on purposes and problems of various forms of communication disorders research, procedures and instruments employed, and reporting of research. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5113. Seminar in Early Intervention. 3 Hours.

Study of a family-centered, transdisciplinary approach to early intervention with infants and toddlers at-risk for communication disorders. Topics include early communication development, service delivery in a family context, coordination with other disciplines, legislation mandating services, and providing services to children with multiple disabilities. Prerequisite: CDIS 3223 or equivalent, and graduate standing. (Typically offered: Spring)

CDIS 5121L. Feeding and Swallowing Disorders Lab. 1 Hour.

Observation and interpretation of techniques used for assessment and remediation of feeding and swallowing disorders in children and adults. Prerequisite: Enrollment in CDISMS program or Instructor Consent. (Typically offered: Fall)

CDIS 5122. Feeding and Swallowing Disorders. 2 Hours.

Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children and adults. Prerequisite: Enrollment in CDISMS program or Instructor Consent. (Typically offered: Fall)

CDIS 5143. Cognitive-Communication Development and Disorders. 3 Hours.

Study of normal cognitive development, the role of communication in this development, and shifts that may occur in conjunction with various speech, language and/or hearing disorders. Prerequisite: CDIS 3223. (Typically offered: Fall)

CDIS 5153. TBI and Right-Hemisphere Disorders. 3 Hours.

Study of the speech and language disorders commonly resulting from traumatic brain injury and right hemisphere disorders. Prerequisite: Enrollment in CDISMS program or instructor consent. (Typically offered: Spring)

CDIS 5173. Sign Language and Deafness. 3 Hours.

(Formerly CDIS 4103.) An introduction to American Sign Language (ASL) and the Deaf Community that uses it. This class will study expressive and sign language skills using ASL vocabulary, structure and grammar. The Deaf Community will be studied through videotapes and readings. Issues in Deaf Education will also be introduced. Graduate degree credit will not be given for both CDIS 4103 and CDIS 5173. (Typically offered: Fall, Spring and Summer)

CDIS 5183. Advanced Clinical Practicum I. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5203. Introduction to Aural Rehabilitation. 3 Hours.

(Formerly CDIS 4133.) Study of the technique used in the rehabilitation of speech and language problems of the hearing impaired including the role of amplification, auditory training, and speech reading in rehabilitation. Graduate degree credit will not be given for both CDIS 4133 and CDIS 5203. Prerequisite: CDIS 3103. (Typically offered: Spring)

CDIS 5213. Voice and Resonance Disorders. 3 Hours.

Study of disorders of phonation and resonance, including etiologies, diagnosis, and intervention strategies. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5223. Fluency Disorders. 3 Hours.

An examination of fluency disorders including theory, etiological factors, and development. In addition, the course is designed to address assessment and management of fluency disorders consistent with evidence-based practice for prospective speech-language pathologists. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5233. Speech Sound Disorders. 3 Hours.

Assessment and treatment of disorders in speech articulation. Prerequisite: Graduate standing. (Typically offered: Summer)

CDIS 5243. Language Disorders in Adults. 3 Hours.

Cognitive and communicative breakdown due to neurological trauma, including etiology, characteristics, assessment and treatment for aphasia, traumatic brain injury, and right hemisphere disorders. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 5253. Motor Speech Disorders. 3 Hours.

Study of motor speech production disorders related to damage to central or peripheral nervous system motor centers and pathways. Cerebral palsy, adult dysarthria, apraxia, and dysphagia are emphasized. Both theoretical and treatment considerations are addressed. Prerequisite: Enrollment in the Communication Sciences and Disorders Master of Science (CDISMS) program or instructor consent. (Typically offered: Spring)

CDIS 5263. Advanced Audiology. 3 Hours.

(Formerly CDIS 4263.) Study of the basic techniques used in audiological assessment of children and adults, including pure tone audiometry, speech audiometry, and special tests of hearing function. Graduate degree credit will not be given for both CDIS 4263 and CDIS 5263. Prerequisite: CDIS 3103. (Typically offered: Fall)

CDIS 5273. Language, Learning and Literacy. 3 Hours.

An examination of language-based literacy skills, including consideration of development, disorders, assessment and intervention. Prerequisite: Enrollment in CDISMS program or instructor consent. (Typically offered: Summer)

CDIS 5283. Advanced Clinical Practicum II. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing and CDIS 5183. (Typically offered: Spring)

CDIS 5293. Augmentative and Alternative Communication. 3 Hours.

Approaches to communication management with the severely and profoundly handicapped child or adult, with primary emphasis on augmentative and alternative communication assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5303. Clinical Assessment of Speech and Language Disorders. 3 Hours.

(Formerly CDIS 4183.) Study of the basic diagnostic procedures used in speech-language pathology. Emphasis is placed on the clinical processes of assessment, including criteria for test selection, techniques in test administration, and interpretation of test. Graduate degree credit will not be given for both CDIS 4183 and CDIS 5303. Pre- or Corequisite: Prior coursework in CDIS and ANTH 1023. (Typically offered: Spring)

CDIS 5313. Introduction to Speech and Hearing Science. 3 Hours.

(Formerly CDIS 4213.) Study of the acoustic structure of oral speech and the auditory skills underlying speech perception. Graduate degree credit will not be given for both CDIS 4213 and CDIS 5313. Prerequisite: CDIS 3203, CDIS 3213, CDIS 3124 and its lab component. Pre- or Corequisite: MATH 1203 or higher. (Typically offered: Spring)

CDIS 5323. Language Disorders in Children. 3 Hours.

(Formerly CDIS 4223.) Study of disorders of language acquisition and usage in children and adolescents, with emphasis upon the nature, assessment, and treatment of such disorders. Graduate degree credit will not be given for both CDIS 4223 and CDIS 5323. Prerequisite: CDIS 3223. (Typically offered: Spring)

CDIS 5353. Neurological Bases of Communication. 3 Hours.

(Formerly CDIS 4253.) A study of the structures and functions of the central and peripheral nervous systems as they relate to human speech, language, and cognition. Graduate degree credit will not be given for both CDIS 4253 and CDIS 5353. Prerequisite: Enrollment in the Communication Sciences and Disorders Master of Science (CDISMS) program or Instructor Consent. (Typically offered: Fall)

CDIS 5373. Communication Behavior and Aging. 3 Hours.

(Formerly CDIS 4273.) Study of the effects upon communication of normal aspects of the aging process, from early adulthood throughout the lifespan. Changes in speech, language, and hearing functioning are identified; common alterations in communicative disorders commonly associated with advanced age are discussed. Graduate degree credit will not be given for both CDIS 4273 and CDIS 5373. (Typically offered: Fall)

CDIS 5383. Advanced Clinical Practicum III. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing and CDIS 5283. (Typically offered: Summer)

CDIS 5391. Clinical Practicum: Hearing Disorders. 1 Hour.

Practicum in audiology. (Typically offered: Fall, Spring and Summer)

CDIS 5443. Advanced Clinical Practicum IV. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing, CDIS 5183, CDIS 5283, and CDIS 5383. (Typically offered: Fall)

CDIS 548V. Off-Campus Practicum: Public School Site. 1-6 Hour.

Practicum activities in speech-language disorders in a public school setting. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CDIS 5511. Professional Issues I. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Fall)

CDIS 5521. Professional Issues II. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Spring)

CDIS 5531. Professional Issues III. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Fall)

CDIS 558V. Internship: Clinical Site. 3-6 Hour.

Field placement in approved clinical setting for clock hours in speech-language pathology assessment and treatment. Students in the master's program must enroll in a minimum of 3 credit hours of CDIS 558V or CDIS 578V during their last semester of graduate studies. Prerequisite: Graduate standing; Completion of one semester of either CDIS 548V or CDIS 568V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 5663. Advanced Clinical Practicum V. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 568V. Off-Campus Practicum: Clinical Site. 1-6 Hour.

Practicum activities in speech-language disorders in an off-campus clinical site. Prerequisite: Graduate standing, CDIS 5183, CDIS 5283, and CDIS 5383. (Typically offered: Fall, Spring and Summer)

CDIS 578V. Internship: Public School Site. 3-6 Hour.

Field placement in approved public school setting for clock hours in speech-language pathology assessment and treatment. Students in the Master's program must enroll in a minimum of 3 credit hours of CDIS 578V or CDIS 558V during their last semester of graduate studies. Prerequisite: Graduate standing; Completion of one semester of either CDIS 548V or CDIS 568V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 5813. Advanced Auditory (Re)Habilitation. 3 Hours.

This course provides students with an in-depth knowledge of hearing anatomy and physiology as well as current hearing and hearing assistive technologies. The development of auditory skills across the lifespan will be discussed as well as intervention techniques to facilitate auditory, speech, and spoken language skills across the lifespan. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5823. Language Learning with Multiple Disabilities. 3 Hours.

Approaches to services (assessment and intervention) for individuals who, as a result of multiple disabilities, are in the beginning stages of language development including the preintentional and presymbolic stages. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5843. Communication and Swallowing in Dementia. 3 Hours.

This course provides an in-depth examination of the communication and feeding/swallowing factors demonstrated by patients with dementia. Etiologies, symptoms, progression, evaluation, and appropriate interventions for of the most common forms of dementia are addressed. Prerequisite: Graduate standing. (Typically offered: Summer)

CDIS 5883. Policies & Procedures in Educational Speech-Language Pathology. 3 Hours.

Educational Speech Pathology is designed to familiarize the student the factors related to functioning as an SLP in an educational setting, including state and federal regulations/standards, service delivery considerations, eligibility criteria, and documentation. Prerequisite: Graduate Standing. (Typically offered: Summer)

CDIS 590V. Special Problems. 1-6 Hour.

Special problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 599V. Seminar in Professional Issues. 1-3 Hour.

Selected topics in professional issues in speech-language pathology and audiology. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

CDIS 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CDIS 6103. Literacy for Learning in Educational Settings. 3 Hours.

An examination of language-based literacy skills, including consideration of development, disorders, assessment, and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 6203. Advanced Assessment and Intervention for Fluency Disorders. 3 Hours.

An examination of fluency disorders including theory, etiological factors, and development. In addition, the course is designed to address assessment and management of fluency disorders consistent with evidence-based practice for prospective speech-language pathologists. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 6303. Effective Augmentative and Alternative Communication Services in Schools. 3 Hours.

This course will support current speech-language pathologists in becoming more effective speech-language pathologists as it relates to the provision of augmentative and alternative services in schools. Throughout this course, students will (a) identify a barrier they wish to address relevant to their current service provision or their current caseload, (b) discover strategies for addressing that barrier, and (c) develop a plan for improving their augmentative and alternative service provision through the implementation of those strategies in their own professional work. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 6403. Advanced Pediatric Feeding and Swallowing Assessment & Intervention. 3 Hours.

Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children. Prerequisite: Graduate standing. (Typically offered: Irregular)

CDIS 6503. Behavioral Management in Educational Settings. 3 Hours.

The course provides an introduction to behavioral management across a variety of settings highlighting best practices from organizing time, materials, and room space. Strategies for managing individual and large group student behaviors, transitions, and other arrangements will be presented in addition to basic federal and state laws as they pertain to the legal procedures for all professionals, including educators of students with disabilities and students who use English as a Second Language (ESL). Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 699V. Seminar in Communication Sciences and Disorders. 1-6 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

Counselor Education Courses

CNED 5003. Counseling and Human Development. 3 Hours.

This course is intended to give students a broad overview of human nature/behavior through knowledge of lifespan developmental theory, personality development, modern & post-modern approaches to the study of human nature/behavior, and learning theory. Throughout the course, close attention will be given to human ecology or those social/historical/cultural/environmental forces furthering or impeding development. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CNED 5193. Clinical Mental Health Counseling. 3 Hours.

An introductory study of community counseling. The course content includes information concerning the educational, historical, philosophical, and psychological foundations of community counseling as well as specific traits and skills of professional community counselors. In addition, the course is designed to provide introductory level concepts and skills required for future certification and licensure as counseling professionals. Prerequisite: Graduate student status. (Typically offered: Spring)

CNED 5203. Foundations of the Counseling Profession. 3 Hours.

A study of the counseling profession applicable to school, college and community agency settings. Introduction to the basic educational, historical, philosophical foundations of counseling as well as specific traits and skills of counselors. The course is also designed to provide beginning level concepts and skills required for certification and licensure. Prerequisite: Must be taken first year in program. (Typically offered: Fall and Summer)

CNED 5213. Lifestyle & Career Development. 3 Hours.

Theories of career development and counseling, including the use of occupational information sources and career assessment tools and techniques. Prerequisite: CNED 5333. (Typically offered: Summer)

CNED 5223. Introduction to School Counseling. 3 Hours.

Philosophy, organization, and practices of a counseling program in the elementary and secondary school. The school counselor's role as counselor, consultant, and coordinator, professional identity, and legal issues are included. Includes a significant focus on ethical standards and issues. (Typically offered: Irregular)

CNED 5303. Individual Appraisal. 3 Hours.

Analysis of concepts, methods, and procedures utilized in individual appraisal. (Typically offered: Fall)

CNED 5313. Program Organization and Information Management. 3 Hours.

This course addresses needs and strategies for effective development and management of school counseling programs and guidance curriculum. Prerequisite: CNED 5223. (Typically offered: Fall)

CNED 5323. Counseling Theory. 3 Hours.

Introductory survey and critical analysis of major alternative theoretical perspectives in counseling. (Typically offered: Fall and Summer)

CNED 5333. Basic Counseling Techniques. 3 Hours.

Introduction to basic counseling techniques and skills common to multiple theoretical perspectives. Prerequisite: Master's students in Counseling. (Typically offered: Fall and Spring)

CNED 5343. Counseling Practicum. 3 Hours.

Supervised counseling practice. CNED faculty consent required. Pre- or Corequisite: CNED 5303 and CNED 5363 and CNED 5373. Prerequisite: CNED 5203, CNED 5323, CNED 5333, CNED 5403. (Typically offered: Fall and Spring)

CNED 5353. Psychopharmacology. 3 Hours.

Study of theory, research, & practice issues pertaining to psychopharmacology for non-medical practitioners. Prerequisite: CNED 5203, CNED 5323, and CNED 5333. (Typically offered: Summer)

CNED 5363. Dynamics of Group Counseling. 3 Hours.

Therapeutic and other theoretical information is presented regarding group process and the counselor's role in that process. An experiential group experience is required. Prerequisite: CNED 5333 and CNED 5323. (Typically offered: Fall and Spring)

CNED 5373. Ethical and Legal Issues in Counseling. 3 Hours.

Review of ethical and legal standards governing professional counselor training, research, and counseling practice; including client rights; confidentiality; the client-counselor relationship; and counseling research, training, and supervision. Prerequisite: CNED 5003 and CNED 5203. (Typically offered: Fall)

CNED 5383. Crisis Intervention Counseling. 3 Hours.

Analysis and application of short-term counseling intervention strategies in crisis situations, with special attention to incidents involving rape, physical, or emotional abuse, divorce, suicidal depression, grief, marital or family instability, and violent conflict. Prerequisite: CNED 5333. (Typically offered: Summer)

CNED 5403. Diagnosis and Treatment in Counseling. 3 Hours.

Procedures in case management utilizing both clinical and interview data in assisting children, adolescents, and adults in educational, vocational, personal, and social planning. Prerequisite: CNED 5303, CNED 5323 and CNED 5333. (Typically offered: Fall and Spring)

CNED 5443. Vocational Rehabilitation Foundations. 3 Hours.

Survey of the philosophy of vocational rehabilitation, including history and legislation. (Typically offered: Fall)

CNED 5453. Medical Aspects of Disability. 3 Hours.

Orientation to medical and medically related aspects of various disabling conditions with emphasis on the severely disabled. (Typically offered: Spring)

CNED 5463. Rehabilitation Case Management. 3 Hours.

Counseling process in the rehabilitation setting. Focusing upon effective counseling strategies, representative cases, and effective case management methods. (Typically offered: Spring)

CNED 5473. Psychological Aspects of Disability. 3 Hours.

Intensive study of the psychological aspects of adjustment to atypical physique and prolonged handicapping condition. (Typically offered: Spring)

CNED 5483. Counseling Research. 3 Hours.

An in-depth examination of counseling research methodology and issues to prepare students to critically evaluate and use counseling research in their professional practice. (Typically offered: Fall, Spring and Summer)

CNED 5493. Principles and Practices of Psychiatric Rehabilitation. 3 Hours.

The course introduces students to the principles and practices of recovery-oriented, evidence-based psychiatric rehabilitation. Through lectures, guest presentations, films, discussions, and readings, students (a) explore the clinical, psychosocial, and vocational aspects of psychiatric disabilities and (b) examine psychiatric rehabilitation principles and practices to facilitate community integration and successful employment outcomes for individuals with psychiatric disabilities. (Typically offered: Fall)

CNED 5513. Counseling and Human Diversity. 3 Hours.

Examination of human and cultural diversity, emphasizing issues of race, class, and socioeconomic status, and how they impact our clients as individuals and as family and society members. (Typically offered: Summer)

CNED 5523. Process and Behavioral Addictions. 3 Hours.

This course provides an overview of non-substance related addictive disorders such as technology (e.g., video games, Internet, television), gambling, eating, sex, shopping/buying and work as well as potential treatment options for these disorders. (Typically offered: Irregular)

CNED 5533. Introduction to Adventure Therapy. 3 Hours.

This course builds on the foundational understanding of group counseling theory and skills by introducing students to Adventure Therapy (AT), an activity-oriented form of group counseling. Students will integrate previous knowledge pertaining to group counseling with new AT concepts as well as review issues related to current research, best practices, and working with diverse populations. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CNED 5583. Placement of Persons with Disabilities. 3 Hours.

Focuses on placement theory and practice as they apply to persons who experience disabilities. Special attention is given to RehabMark approach. (Typically offered: Summer)

CNED 574V. Counseling Internship. 1-9 Hour.

A 600-clock-hour field placement in an approved setting over a minimum of two continuous semesters. For students completing a counseling internship in a school setting, successful completion of a criminal background check is required before beginning internship. Pre- or Corequisite: CNED 5213. Prerequisite: CNED 5203, CNED 5303, CNED 5323, CNED 5333, CNED 5343, CNED 5363, CNED 5373, CNED 5403, CNED 5513. CNED faculty consent required. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

CNED 599V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CNED 6003. Theories and Foundations of Addictions. 3 Hours.

A study of behavioral and substance addictions, including an overview of differential treatment. Prerequisite: CNED 5323 and CNED 5333, and admission to the CNED masters or doctoral program or departmental consent. (Typically offered: Spring and Summer)

CNED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CNED 6013. Advanced Counseling Theory and Methods. 3 Hours.

Critical analysis of major theoretical perspectives in counseling, including both group and individual counseling strategies for dealing with affective, cognitive, and behavioral dysfunction. Prerequisite: CNED doctoral standing or permission. (Typically offered: Spring Even Years)

CNED 6023. Foundations of Marriage and Family Counseling Therapy. 3 Hours.

Comprehensive exploration of the current theories/techniques of marriage, family and couples counseling. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or permission. (Typically offered: Summer)

CNED 6033. Advanced Group Theory and Methods. 3 Hours.

Comparative study of theories and processes of group counseling. Includes supervised experience in group facilitation with video recording and playback. Prerequisite: CNED 5363 or equivalent and CNED doctoral or masters standing or permission. (Typically offered: Spring Odd Years)

CNED 6043. Supervision of Counselors. 3 Hours.

Analysis, assessment, and practical application of counselor supervision techniques in treatment and training programs. Prerequisite: CNED doctoral standing and CNED faculty consent (Typically offered: Fall Even Years)

CNED 605V. Independent Study. 1-18 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CNED 6073. Advanced Research in Counseling. 3 Hours.

This course involves acquiring a knowledge and understanding of the use of research in counseling and the development of new research in the counseling profession that has heuristic value. Prerequisite: Graduate standing. (Typically offered: Spring)

CNED 6083. Consultation Theory and Methods. 3 Hours.

Strategies, practical application, and techniques for effective consultation with parents, teachers, and community agencies. Prerequisite: CNED 5333 (preferred) CNED doctoral or masters standing or permission. (Typically offered: Summer)

CNED 6093. Counseling Children and Adolescents Through Play. 3 Hours.

Introduction to counseling children and adolescents through play; including the process, theories, techniques, and materials applicable to children and adolescents in a pluralistic society. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or permission. (Typically offered: Spring)

CNED 6133. Introduction to Play Therapy. 3 Hours.

This course is an introduction to the basic concepts of child-centered play therapy (CCPT). Students will learn the conceptual framework of child-centered play therapy, as well as the attitudes and skills necessary to establish and maintain facilitative relationships with children that encourage their self-expression and facilitate change. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or consent. (Typically offered: Irregular)

CNED 6223. Foundations of Counselor Education and Supervision. 3 Hours.

This course is designed to enhance the professional development and acculturation of doctoral students in order to facilitate their success in professional leadership roles of counselor education, supervision, counseling practice, and research competencies. Prerequisite: CNED Doctoral status or permission. (Typically offered: Spring Odd Years)

CNED 6233. Employment Practices and Interventions. 3 Hours.

An intensive study of the employment experiences of workers with disabilities with emphasis on disincentives and barriers to employment and interventions to enable people with disabilities to participate in employment. Prerequisite: Rhab 5493 or equivalent. (Typically offered: Irregular)

CNED 6243. Disability Policy in the U.S.. 3 Hours.

An analysis of public policy approaches to disability in the U.S. Examines the political and philosophical origins of disability policy; reviews major disability legislation and its effects on policy stakeholders; describes recent initiatives; and analyzes evolution of disability policy within context of changing societal, economic, and political conditions. (Typically offered: Fall)

CNED 6253. Advanced Psychosocial Aspects of Disability. 3 Hours.

A theoretical and applied study of techniques that enable people to cope with 2 major life events: disability and unemployment. (Typically offered: Fall Odd Years)

CNED 6343. Cultural Foundations and Counseling. 3 Hours.

To gain learning experiences in pedagogy relevant to multicultural issues and competencies, including social change theory and advocacy action planning. To identify current multicultural issues as they relate to social change theories, ethical and legal considerations, disability, gender, sexuality, social justice, and advocacy models. Prerequisite: CNED or Rhab Doctoral Standing or Permission. (Typically offered: Fall Even Years)

CNED 6713. Advanced Counseling Practicum. 3 Hours.

Supervised counseling practice. A 100-clock hour approved practical counseling experience. Prerequisite: CNED doctoral standing and permission of CNED faculty and Clinical Coordinator. (Typically offered: Spring) May be repeated for up to 3 hours of degree credit.

CNED 674V. Internship. 1-18 Hour.

Supervised field placement (Clinical/Instructorship/Supervision/Research). Prerequisite: CNED doctoral standing, CNED faculty consent and CNED Clinical Coordinator consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CNED 699V. Seminar. 1-18 Hour.

Seminar. Prerequisite: CNED Doctoral standing or permission. (Typically offered: Summer) May be repeated for up to 18 hours of degree credit.

CNED 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy and consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Higher Education Courses

HIED 5003. Overview-American Higher Education. 3 Hours.

A basic course in the study of higher education open to all students seeking careers in colleges and universities. Serves as an introduction to the programs, problems, issues, and trends in higher education. (Typically offered: Fall)

HIED 5033. Student Affairs in Higher Education. 3 Hours.

Study of origins, functions, and policies in student personnel services in contemporary 2- and 4-year colleges and universities with emphasis on the student and student development. (Typically offered: Fall)

HIED 5043. Student Development in Higher Education. 3 Hours.

Provides those who work or plan to work in post secondary educational institutions with an understanding of the student population in contemporary colleges and universities. (Typically offered: Spring)

HIED 504V. Practicum in Higher Education. 1-6 Hour.

Students are assigned to a department or agency within or outside the university for professional experience under the joint supervision of on-site personnel and university faculty. Periodic meetings are scheduled for evaluation, discussion, and examination of techniques. (Typically offered: Fall, Spring and Summer)

HIED 5053. The Community College. 3 Hours.

An overview of the community college. Topics include the history and philosophy of the community college movement, students, curriculum, state and local campus governance, teaching, student personnel work, finance and issues, problems, and trends. (Typically offered: Irregular)

HIED 5063. Diversity in Higher Education. 3 Hours.

Broadly explores how sociocultural contexts influence diversity at colleges and universities. Focuses on the responsibilities of higher education leaders to be multiculturally competent professionals who foster inclusive practices for diverse student populations. (Typically offered: Irregular)

HIED 5073. Management of Higher Education Institutions. 3 Hours.

Principles and concepts of management and their application in college and university settings. (Typically offered: Fall and Summer)

HIED 5083. History and Philosophy of Higher Education. 3 Hours.

An examination of the history and development of higher education including the study of the philosophy, objectives, and functions of various types of institutions. (Typically offered: Spring)

HIED 5093. Research in Higher Education and Student Affairs. 3 Hours.

This course provides master's students an overview of research and literature applicable to the discipline; teaches students how to understand academic literature and use empirical evidence to inform practices and policies at colleges and universities. Prerequisite: MEd students in the Higher Education Program. (Typically offered: Fall, Spring and Summer)

HIED 5103. Higher Education in International Contexts. 3 Hours.

Explores various systems of higher education around the world. Equips students with the knowledge and skills to work in the increasingly internationalized field of higher education. (Typically offered: Irregular)

HIED 5303. Non-Profit Fundraising. 3 Hours.

Non-Profit Fundraising examines the theory and practice of the professional field of fundraising and development, which is dedicated to attracting philanthropic support from constituents for colleges, universities, health organizations, hospitals, non-profit organizations, museums and other philanthropic endeavors. (Typically offered: Irregular)

HIED 5643. Reflective Practice in Higher Education and Student Affairs. 3 Hours.

Provides students an opportunity to work in a functional area of higher education, reflect on how their experiences inform their career goals as higher education professionals, and learn job search strategies in higher education. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HIED 574V. Internship. 1-3 Hour.

Supervised field experiences in student personnel services, college administration, academic advising, institutional research, development, or other areas of college and university work. (Typically offered: Fall, Spring and Summer)

HIED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIED 6013. The Professoriate: Problems and Issues. 3 Hours.

An examination of the vital issues and trends affecting college faculty personnel with emphasis upon institutional practices and policies. (Typically offered: Irregular)

HIED 6023. Introduction to the Study of Higher Education. 3 Hours.

A requirement for all new doctoral and specialist students. Familiarization with writing requirements, library search procedures, library resources, and program requirements. Prerequisite: Admission to Higher Education Ed.D program. (Typically offered: Irregular)

HIED 605V. Independent Study. 1-6 Hour.

Provides students with an opportunity to pursue special study in higher education. (Typically offered: Fall, Spring and Summer)

HIED 6083. Management Skills for Effective Leadership. 3 Hours.

Development of management skills that enhance leadership includes understanding yourself, managing yourself, team building, personnel selection, group and individual decision-making, problem solving, managing conflict, developing valid performance appraisal systems, conducting performance appraisal interview, and other topics of current interest. Prerequisite: Doctoral students in Higher Education or permission of the instructor. (Typically offered: Irregular)

HIED 6093. Leading Change. 3 Hours.

An in-depth examination of leadership, change, and culture in postsecondary education. (Typically offered: Irregular)

HIED 6303. Advancement in Higher Education. 3 Hours.

Advancement in Higher Education examines the theory and practice of the professional field and function referred to as 'institutional advancement', which is dedicated to attracting philanthropic support as well as building attitudinal and behavioral support among key constituents for colleges and universities. (Typically offered: Irregular)

HIED 6323. Design and Evaluation of College Teaching. 3 Hours.

Theory and practice of effective college teaching. Emphasis is placed on preparation and evaluation of instruction. (Typically offered: Irregular)

HIED 6343. Strategies for Effective College Teaching. 3 Hours.

An examination of traditional and innovative instructional strategies for use in college teaching. (Typically offered: Irregular)

HIED 6353. The College and University Presidency. 3 Hours.

The course explores the basic elements of the presidency of an academic institution and examines the critical issues facing the college and university presidents/chancellors. (Typically offered: Irregular)

HIED 6423. Trends, Issues and Problems in Higher Education. 3 Hours.

A study of the current problems and trends related to the field of higher education. (Typically offered: Irregular)

HIED 6483. Strategic Enrollment Management. 3 Hours.

An examination of admissions marketing strategies, communications plans, branding, and forecasting as well as how other areas (financial aid, honors, scholarships, and student affairs) contribute to successful recruitment efforts. Other key enrollment management areas of focus for the class include academic records, registration, degree audits, FERPA, student support, and most importantly, retention. Major state and federal legislation that underscores any of these activities will be discussed as well. (Typically offered: Irregular)

HIED 6533. Assessment of Institutional Effectiveness in Higher Education. 3 Hours.

The course examines the fundamentals of assessment of learning outcomes and institutional effectiveness and introduces assessment as a tool to inform strategic planning and data-driven decision-making in higher education. (Typically offered: Irregular)

HIED 6643. College Students in the United States. 3 Hours.

Students will engage with the leading theoretical and empirical scholarship related to college students and use this information to engage in class discussion, complete course assignments, consider implications for practice, and contemplate opportunities for new scholarship. Prerequisite: Doctoral student in the Higher Education Program or instructor consent. (Typically offered: Irregular)

HIED 6653. Legal Aspects of Higher Education. 3 Hours.

An examination of the legal status of higher education in the United States; the rights and responsibilities of educators and students including fair employment; due process; torts liability and contracts; student rights landmark court decisions; federal and state legislation having an impact on education. (Typically offered: Fall and Spring)

HIED 6663. Finance and Fiscal Management. 3 Hours.

Higher education finance and budgeting practices: problems, issues, trends, and policy issues in higher education. (Typically offered: Irregular)

HIED 6683. Governance and Policy Making in Higher Education. 3 Hours.

An analysis of governance and policy making affecting the control of colleges and universities. Attention is given to policy generation, governing board supervision, and the impact of institutional, professional, and regional groups as well as community, state, and federal pressures. (Typically offered: Irregular)

HIED 6693. Research Techniques in Higher Education. 3 Hours.

Techniques of research applicable to Higher Education. (Typically offered: Irregular)

HIED 674V. Internship. 1-6 Hour.

Supervised field experiences in student personnel services, college administration, college teaching, institutional research, development, or other areas of college and university work. (Typically offered: Fall, Spring and Summer)

HIED 699V. Seminar. 1-6 Hour.

A series of seminar for specialized study into areas of current significance in postsecondary education, such as leadership and planning; organization, development, and change; human resource development and appraisal; the student in higher education; etc. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

HIED 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Human Resource and Workforce Development Education Courses

HRWD 5113. Foundations of Human Resource & Workforce Development. 3 Hours.

An overview of human resource and workforce development (HRWD) in organizations. Focus on the integration of training and development, career development, and organization development. Topics include strategic planning for human resource and workforce development, needs assessment, program development, application of workplace learning theories, career development theories and methods, and application of organization learning theories. (Typically offered: Fall, Spring and Summer)

HRWD 5123. Career Transitions. 3 Hours.

This advanced level course is intended for career development professionals and/or subject-matter experts interested in improving their career development skills within a structured or unstructured learning environment. The emphasis in this course is on gaining career development techniques and planning formal and informal career development strategies for the individual or the organization. (Typically offered: Spring)

HRWD 5133. HRWD Diversity Issues. 3 Hours.

This course emphasis is on current trends and case studies of diversity in the workplace. Prerequisite: Graduate standing. (Typically offered: Fall)

HRWD 5213. Organizational Analysis. 3 Hours.

This course introduces the analysis process in organizations. The instruction and activities will enable students to develop skills in conducting organizational needs analysis (OA) as a basis for performance improvement in the workplace. (Typically offered: Spring and Summer)

HRWD 5223. Strategic Human Resource and Workforce Development Education. 3 Hours.

A comprehensive examination of the issues, topics, principles, theories, philosophies and concepts facing tomorrow's HRD professionals. Includes the transformation of strategic HRD; the role of strategic HRD leaders as change agents; the principles of strategic HRD; professional practice do mains of strategic HRD; organizational learning, performance, and change; and analysis, design, and evaluation of HPI interventions. Students will identify practices for informing decisions related to the formation of strategic HRD planning and implementation efforts. (Typically offered: Fall)

HRWD 5233. HRWD Employment, Legal, and Ethical Issues. 3 Hours.

This course focuses on employment, legal and ethical issues within the workplace. Students will gain knowledge that should enable them to be effective in understanding current employment concerns, equal employment opportunity (EEO) laws, and ethical practices within the workplace and how these employment concerns, laws, and practices impact society. (Typically offered: Spring)

HRWD 5313. Facilitating Learning in the Workplace. 3 Hours.

Facilitation of learning and performance improvement in the workplace. Application of instructional methods, formal and informal learning strategies, coaching, team building, and formal and informal on-the-job learning tactics. Focus on facilitating individual and group learning to affect organizational change. (Typically offered: Spring)

HRWD 5323. International HRWD. 3 Hours.

Exploration of how globalization and culture affect the workplace and the human resource development profession. Difference between global HRD and HRD practiced in a single country. Impact of culture on every aspect of HRD implementation and practice. Examination of HRD practices in different regions of the world. (Typically offered: Fall)

HRWD 5333. HRWD Technological Resources. 3 Hours.

This course provides students with the tools and abilities to evaluate and understand technology resources used in HRWD. Primary course elements are instructional design characteristics of technology, theoretical and practical uses of technology resources to facilitate and manage learning, and selecting the best or most appropriate technological resources. The course uses online technologies and learning experiences. (Typically offered: Fall)

HRWD 5433. HRWD Capstone. 3 Hours.

This course is the final course for the degree in Human Resource and Workforce Development. Students will be assessed on their overall knowledge and understanding of the field. The focus of this course will be research and analysis of classic works and current trends. Pre- or Corequisite: 27 MED credit hours completed. (Typically offered: Fall, Spring and Summer)

HRWD 571V. Independent Study. 1-3 Hour.

Independent study. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HRWD 572V. Workshop. 1-3 Hour.

Workshop. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HRWD 573V. Experiential Learning. 1-18 Hour.

This course is designed for the student to attain paid or unpaid experiential development. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

HRWD 6313. Project and Program Evaluation. 3 Hours.

This course is a doctoral level course designed as an introduction to project and program evaluation in human resource and workforce development. Emphasis is on (a) project design and development, (b) program development and improvement, and (c) the integration of evaluation with strategic planning and performance improvement. (Typically offered: Spring Even Years)

HRWD 6323. Qualitative Research Design and Analysis. 3 Hours.

This course is designed to introduce HRWD students to qualitative research design, data collection and data analysis. Course content includes data collection through interviews, field observation, records research, ethical issues associated with conducting research in organizational settings, and internal and external validity problems. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Spring Even Years)

HRWD 6333. Quantitative Research Design and Analysis. 3 Hours.

This course provides HRWD students with the tools and abilities to design and implement an original research project using quantitative measures. Primary course elements are research design application, theoretical settings of research, and nesting research within an appropriate literature base. The course uses online technologies and on-campus learning experiences. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Fall Even Years)

HRWD 6343. Principles and Techniques of Research in HRWD. 3 Hours.

This course addresses the principles and techniques underlying organizational research, both experimental and non-experimental. It covers the basic philosophy of science and research methods and gives attention to the practical problems of design, data collection sampling, and data analysis. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Fall Even Years)

HRWD 6413. Career Theory and Decision Making. 3 Hours.

This course focuses on comprehensive understanding of career theory and decision making to enhance career development that emphasizes technology, cross-cultural issues, practical application, and the global economy. Career development in both the private and public sectors will be explored. Students will gain knowledge that should enable them to be effective in developing their careers and those of others using multicultural considerations and a global perspective. (Typically offered: Fall)

HRWD 6423. Practicum. 3 Hours.

Practicum is designed to allow doctoral students in workforce development education an opportunity to apply the theoretical knowledge, skills and abilities to training, teaching, or research projects. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HRWD 6513. Organization Development. 3 Hours.

This course teaches development of organization activities that intervene in the interaction of people systems to increase the effectiveness of using a variety of applied behavioral sciences. It includes the dynamics of organizations, the genesis of organizational theory and evolution of organizational dynamics, including examination of system structure, chaos theory, group dynamics and interaction, leadership theories, diversity issues impacting organizations, and techniques of change agent intervention. (Typically offered: Summer Odd Years)

HRWD 6523. Leadership Models and Concepts. 3 Hours.

This doctoral course concentrates on using commonly accepted principles of leadership to develop skills needed in workforce development education settings. (Typically offered: Fall Odd Years)

HRWD 6533. HRWD Ethical and Legal Issues. 3 Hours.

Focuses on ethical and legal issues within the workplace and behavioral science research. Students gain knowledge that should enable them to be effective in understanding ethical and legal issues within their workplace and how they can impact society. (Typically offered: Fall)

HRWD 6613. Learning and Teaching Theories. 3 Hours.

Models and philosophies of important theorists in the field of teaching and learning. (Typically offered: Spring Odd Years)

HRWD 6633. Technology Systems in Human Resource and Workforce Development. 3 Hours.

This course provides students with the tools and abilities to evaluate and understand technology systems in HRWD. Primary course elements are instructional design characteristics of technology systems, theoretical and practical settings that use technology systems to facilitate and manage learning, and selecting the best or most appropriate system for organizational use. The course uses online technologies and learning experiences. (Typically offered: Fall Odd Years)

HRWD 6643. History and Foundations of HRWD. 3 Hours.

This course focuses on the history of human resource development as a practice and a profession. Particular emphasis in this course is placed on the influence of philosophy on developing HRD theory and practice. As students progress through this course they can expect to gain greater understanding of how HRD developed as a profession, the historical root of its theory and practice, and an understanding of how to evaluate the philosophical assumptions of current HRD theory and practice. (Typically offered: Fall Even Years)

HRWD 6713. HRWD Curriculum Design. 3 Hours.

Determining principles of curriculum development, implementation, and evaluation with emphasis in human resource development education. (Typically offered: Summer)

HRWD 6723. Entrepreneurial Development. 3 Hours.

An advanced graduate-level course examining the history, economics, theory and practice of developing Entrepreneurial enterprises. This course presents an overview of the business and organizational systems with which an entrepreneur should be familiar. (Typically offered: Irregular)

HRWD 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Secondary Mathematics (SMTH)

Mark Johnson
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Department of Mathematical Sciences Website (<http://fulbright.uark.edu/departments/math/>)

Degrees Conferred:

M.A. in Secondary Mathematics (SMTH)

The M.A. major in Secondary Mathematics is offered through the Department of Mathematical Sciences.

M.A. in Secondary Mathematics

Requirements for the Master of Arts Degree with a Major in Secondary Mathematics: This program is designed for secondary school teachers of mathematics. It requires 30 semester hours of graduate work.

Prospective candidates for the Master of Arts degree in secondary mathematics are expected to have earned a baccalaureate degree or equivalent with a major in a mathematical science (mathematics, statistics, operations research, or computer science), engineering, or a physical science, and credit in courses equivalent to MATH 2564, MATH 3083, MATH 3113, and MATH 3773.

The program has four components in which to earn a minimum of 30 semester hours of credit:

1. Graduate course work in mathematics content and content-based pedagogy. At least 12 hours of credit in graduate course work specifically designed for preparation for teaching secondary mathematics. The content will include probability and statistics, algebra, geometry, and advanced calculus with connections to secondary school mathematics. At least one of the courses must be in probability and statistics; one in algebra; and one in advanced calculus. These courses are to be selected from:

MATH 5013	Abstract Algebra with Connections to School Mathematics	3
MATH 5023	Geometry with Connections to School Mathematics	3
MATH 5033	Advanced Calculus with Connections to School Mathematics Teaching	3
MATH 5053	Probability & Statistics with Connections to School Mathematics	3
MATH 504V	Special Topics for Teachers	1-6

Other graduate mathematics or statistics courses may be used in place of these courses with the approval of the student's committee.

2. Independent study and research in mathematics or mathematics education. Up to six hours of credit is available in independent study and research under the direction of mathematical sciences faculty. The results will be evidenced by a report roughly equivalent to a master's thesis.
3. Advanced work in professional teacher preparation. Up to six hours of credit in MATH 507V is available for advanced work in preparation for teaching AP calculus, AP statistics, International Baccalaureate

(IB) mathematics, or for achieving National Board Certification in (Adolescence and Young Adulthood) Mathematics. Other professional development activities with quality control features similar to those of the AP, IB, and National Board programs may be presented for consideration for credit. All such work must be sanctioned by the sponsoring organizations.

4. Graduate courses in education. Up to six hours of credit is available in graduate courses in education. The student's committee must approve the courses. Recommended courses include:

CIED 6013	Curriculum Theory, Development, and Evaluation	3
CIED 6043	Analysis of Teacher Education	3
CIED 6053	Curriculum and Instruction: Learner Assessment and Program Evaluation	3

Other graduate courses in education may be used in place of these courses with the approval of the student's advisory committee.

If allowed by Graduate School rules, credit previously earned may be applied to the requirements for this degree with the approval of the student's advisory committee.

Each person receiving the Master of Arts degree in secondary mathematics must pass a written examination in three of the following areas: probability and statistics; algebra; geometry; advanced calculus; and mathematics education. No student will be allowed to take the examination more than three times. Candidates will also present a portfolio describing the body of work with samples of their work as students and explanations of connections to secondary school mathematics.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Social Work (SCWK)

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School of Social Work Website (<http://fulbright.uark.edu/departments/social-work/>)

Degree Conferred:

Master of Social Work (M.S.W.)

Program Description: Professional social workers promote human well-being by strengthening opportunities, resources, and capacities of people in their environments and by creating policies and services to correct conditions that limit human rights and the quality of life. The

social work profession works to eliminate poverty, discrimination, and oppression. Guided by a person-in-environment perspective and respect for human diversity, the profession works to effect social and economic justice worldwide. The purpose of the graduate social work program at the University of Arkansas is to prepare advanced-level professional social workers as leader/practitioners with the capacity to address complex personal, social, community, and economic problems preventing so many of Arkansas' people (and people across the country and globally) from moving out of poverty to self-sufficiency. The M.S.W. program is accredited by the Council on Social Work Education (CSWE).

Areas of Study: The School of Social Work offers focused studies in multi-system life-course. The multi-system life-course perspective prepares students for advanced social work practice with a range of systems (individuals, families, groups, organizations, and communities) and for practice with individuals across the life course as they interact with multiple systems.

Primary Areas of Faculty Research: Healthy aging; human behavior and the social environment theory; gerontology; addictions; health and health disparities; poverty reduction; human diversity; international social work; social work history; women and asset development; children and families; domestic violence; and human trafficking.

M.S.W. in Social Work

Admission Requirements: Admission to the University of Arkansas Graduate School as well as admission to the School of Social Work M.S.W. program is required. Admission requirements for all of the M.S.W. programs include: a baccalaureate degree with a liberal arts perspective from an accredited college or university (official transcripts must be provided). A personal statement of motivation for and experiences supporting admission to the MSW program; a social needs paper that discusses a current social need that is of concern and interest to the applicant; three professional reference letters (faculty, employers, supervisors); a basic statistics course; and computer literacy demonstrated through prior course work.

Admission to the Advanced Standing Program (on campus or on line). Applicants must have a Bachelor of Social Work from a CSWE accredited University in the past six years. If the bachelor's degree was earned over six years ago, the applicant may submit a petition for exception, demonstrating a significant history of social work employment and continuing education. Applicants must have a minimum 3.00 undergraduate GPA on a four-point scale for the last 60 hours of the first bachelor's degree. Applicants are exempt from taking the GRE or MAT.

Admission to the two and three year programs. A minimum 3.00 undergraduate GPA on a four-point scale for the last 60 hours of the first bachelor's degree. Two and three year students may be considered for conditional admission with a 2.75-2.99 GPA with the submission of the Graduate Record Examination (GRE) or Millers Analogies Test (MAT) to the graduate school.

Two-year Program Option: This option is available for students without a baccalaureate degree from a program accredited by the Council on Social Work Education (CSWE). Students in the two-year option must successfully complete a total of 63 credit hours. The following are required Foundation courses:

SCWK 5273	Social Work Research and Technology I	3
SCWK 5093	Human Behavior and the Social Environment I	3
SCWK 5103	Human Behavior and the Social Environment II	3
SCWK 5353	Social Welfare Policy	3

SCWK 5333	Social Work Practice I	3
SCWK 5543	Social Work Practice II	3
SCWK 5733	Social Work Practice III	3
SCWK 5003	Foundations of Culturally Competent Social Work Practice	3
SCWK 5013	Bridge Course: Evidenced Based Social Work	3
SCWK 5412	Foundation Field Seminar	2
SCWK 5434	Foundation Field Internship	4

The following are required Advanced courses:

SCWK 5073	Social Work Research and Technology II	3
SCWK 6003	Advanced Social Work Practice Using the MSLC Perspective	3
SCWK 6442	Advanced Field Seminar I	2
SCWK 6444	Advanced Field Internship I	4
SCWK 6452	Advanced Field Seminar II	2
SCWK 6454	Advanced Field Internship II	4

Three-year Extended Program Option: This option is available for students without a baccalaureate degree from a program accredited by the Council on Social Work Education (CSWE). Students in the three-year extended program must successfully complete a total of 63 credit hours. The following are required foundation courses:

SCWK 5273	Social Work Research and Technology I	3
SCWK 5093	Human Behavior and the Social Environment I	3
SCWK 5103	Human Behavior and the Social Environment II	3
SCWK 5353	Social Welfare Policy	3
SCWK 5333	Social Work Practice I	3
SCWK 5543	Social Work Practice II	3
SCWK 5733	Social Work Practice III	3
SCWK 5003	Foundations of Culturally Competent Social Work Practice	3
SCWK 5013	Bridge Course: Evidenced Based Social Work	3
SCWK 5412	Foundation Field Seminar	2
SCWK 5434	Foundation Field Internship	4

The following are required advanced courses:

SCWK 5073	Social Work Research and Technology II	3
SCWK 6003	Advanced Social Work Practice Using the MSLC Perspective	3
SCWK 6442	Advanced Field Seminar I	2
SCWK 6444	Advanced Field Internship I	4
SCWK 6452	Advanced Field Seminar II	2
SCWK 6454	Advanced Field Internship II	4

Please note that the three-year extended program accepts students every other year (e.g. Fall 2009, 2011, 2013, 2015, etc.)

Advanced Standing Option: Students with a baccalaureate degree from a program accredited by CSWE are eligible to apply for Advanced Standing. This option requires a total of 39 credit hours including SCWK 5013, SCWK 5442, SCWK 5444, and the advanced course work listed above for the two- and three-year options. Students may complete the advanced standing option on campus or online.

Electives:¹ Each student is required to successfully complete three electives (9 credit hours). Electives are chosen in consultation with and with approval from the student's major faculty adviser. Students may enroll in electives outside the School of Social Work, with faculty adviser approval.

Each student is required to successfully complete a population-specific practice course (3 credit hours) from either SCWK 6233 or SCWK 6243. Students may choose to take the other population-specific practice course as an elective.

Graduate social work electives include:

SCWK 5143	Global Social and Economic Justice and Oppression	3
SCWK 5163	Social Work Management, Administration and Supervision	3
SCWK 5173	Advanced Practice with Families and Couples	3
SCWK 5183	Advanced Practice with Individuals	3
SCWK 5213	Advanced Practice in Behavioral and Mental Health	3
SCWK 5253	Spirituality and Social Work Practice	3
SCWK 5343	Advanced Practice with Groups	3

¹ Elective topics often change from semester to semester based on faculty expertise and student interest. Therefore, it is not possible to guarantee specific electives.

Other Requirements: M.S.W. students are required to complete a capstone paper and presentation. The capstone project is a research experience in the area of practice/program evaluation, guided and evaluated by a panel of faculty and senior social work practitioners from the community. Students may choose instead, with faculty approval, to complete a thesis. The thesis option is guided by the student's thesis committee, resulting in a final paper and oral defense. Both options are completed in conjunction with the three-hour Research and Technology course. Only those choosing the thesis option must enroll in thesis hours in their advanced year.

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The Department of Social Work and the School of Law cooperate in offering a dual degree program that allows a student to pursue the Master of Social Work and the Juris Doctor degrees concurrently in order to achieve the following program objectives:

1. To educate practitioners in social work and law to be able to effectively utilize the problem-solving strategies and techniques of both disciplines to the benefit of their clients, their colleagues, and the community.
2. To provide the core curriculum necessary for the education of students in each profession while enabling them to focus on areas of knowledge and practice that correspond to their professional goals.
3. To facilitate integration of the two disciplines through experiential learning opportunities.
4. To promote a philosophy of interdisciplinary collaboration between law and social work professionals and create a collaborative learning environment.

5. To prepare practitioners who have a commitment to a human condition that is free from violence, oppression, and discrimination, and that protects and promotes the development of all people.

J.D./M.S.W. Program

The Juris Doctor/Master of Social Work dual degree is awarded after completion of a four-year integrated course of study. This eliminates approximately one year of study, while meeting all accreditation requirements of the American Bar Association and Council on Social Work Education.

Upon completion of the dual degree, students have earned a total of 135 credit hours (as opposed to 153 credit hours if the degrees are earned separately). A total of 12 hours credit earned in the M.S.W. program count toward completion of the J.D. degree. A total of 6 hours credit earned in the J.D. program count toward completion of the M.S.W. degree. In order to receive dual credit, minimum grade standards for each program must be met.

Students who do not maintain the academic or ethical standards of either degree program may be terminated from the dual degree program. Students in good standing in one degree program but not the other may be allowed to continue in the program in which they have good standing and must meet the degree requirements of that program. If for any reason a student admitted to the dual degree program does not complete the M.S.W. degree, the student cannot count the 12 hours of M.S.W. courses toward the J.D. degree. If for any reason a student admitted to the dual degree program does not complete the J.D. degree, the elective policy for the School of Social Work applies.

To be eligible for admission to the J.D./M.S.W. Dual Degree Program, students must apply separately and be admitted to the master's program at the School of Social Work, to the juris doctor program at the School of Law, and to the joint program. As such, applicants must meet all of the requirements for admission to each program. Upon application to the J.D./M.S.W. dual degree, the applicant shall provide a statement of intent for admission that includes a brief explanation of the reasons for pursuing this dual degree program as well as goals upon completion of the program. Each degree will be conferred when the student has met all the requirements of that degree.

Should a student enter one program and later become aware of the availability of the joint program, the student must be admitted to both programs and to the joint program during his or her first year of class work in the program of original enrollment.

Graduate Faculty Courses

SCWK 5003. Foundations of Culturally Competent Social Work Practice. 3 Hours.

The purpose of this course is the acquisition and demonstration of beginning graduate-level social work values and ethics, knowledge, and skills necessary for cultural competence in work with individuals, families, groups, organizations, communities, and global contexts. A multi-systems life-course conceptual framework is used. Prerequisite: Admission to the two-year or part-time MSW program. (Typically offered: Fall)

SCWK 5013. Bridge Course: Evidenced Based Social Work. 3 Hours.

This course prepares MSW students to transition from the foundation course to the advanced concentration courses. Students will become familiar with the mission and conceptual framework underlying the advanced concentration and develop beginning knowledge of traditional and alternative approaches to client system assessment. Prerequisite: Admission into the advanced standing MSW program or completion of foundation courses. (Typically offered: Summer)

SCWK 505V. Special Topics in Social Work. 1-6 Hour.

(Formerly SCWK 405V.) Comprehensive study of various topics of importance in contemporary social welfare and social work practice. Graduate degree credit will not be given for both SCWK 405V and SCWK 505V. (Typically offered: Irregular) May be repeated for degree credit.

SCWK 5073. Social Work Research and Technology II. 3 Hours.

This course is intended to build the advanced research skills necessary to develop a research proposal and complete a thesis or capstone project. Students will plan the project, collect and analyze data and write a research report of their findings. Projects will focus on systematic evaluation of service delivery and personal professional practice. Prerequisite: Completion of year one for two-year students or summer semester for advanced standing students. (Typically offered: Fall)

SCWK 5083. Social Work With Elders. 3 Hours.

(Formerly SCWK 4183.) Survey of theories of gerontology, service programs and unmet needs of the aging citizen. Graduate degree credit will not be given for both SCWK 4183 and SCWK 5083. (Typically offered: Irregular)

SCWK 5093. Human Behavior and the Social Environment I. 3 Hours.

(Formerly SCWK 4093.) Provides a conceptual framework for knowledge of human behavior and the social environment with a focus on individuals. Social systems, life-course, assets, and resiliency-based approaches are presented. Special attention is given to the impact of discrimination and oppression on the ability to reach or maintain optimal health and well-being. Graduate degree credit will not be given for both SCWK 4093 and SCWK 5093. Prerequisite: COMM 1313, PSYC 2003, SOCI 2013, SCWK 2133, and SCWK 3193 and (BIOL 1543 and BIOL 1541L, or ANTH 1013 and ANTH 1011L). (Typically offered: Fall and Spring)

SCWK 5103. Human Behavior and the Social Environment II. 3 Hours.

(Formerly SCWK 4103.) This course applies the basic framework for creating and organizing knowledge of human behavior and the social environment acquired in HBSE I to the understanding of family, group, organizational, community, and global systems. Attention is given to discrimination, oppression, the impact of technology, and poverty at each system level. Graduate degree credit will not be given for both SCWK 4103 and SCWK 5103. Prerequisite: SCWK 4093 or SCWK 5093 (formerly SCWK 4093) and SCWK 4153 or SCWK 5353 (formerly SCWK 4153). (Typically offered: Fall and Spring)

SCWK 5143. Global Social and Economic Justice and Oppression. 3 Hours.

The role and responsibilities of the social work profession are examined in an international comparative context. Particular emphasis is given to social workers' responsibilities to advance global social and economic justice and reduce human oppression through community, social, economic, and organizational development strategies. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5163. Social Work Management, Administration and Supervision. 3 Hours.

This course develops advanced skills in management, administration, and supervision in social work organizations. Emphasis is placed on developing leadership skills in ethics, budgeting, finance, resource development, information management, evaluation, staff hiring, supervision and development, and the use of technology in organizational leadership, development, and maintenance. Prerequisite: Graduate standing and SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5173. Advanced Practice with Families and Couples. 3 Hours.

The purpose of this course is to provide advanced understanding of the knowledge, skills and values needed to assess and intervene effectively with traditional and non-traditional families and couples. The course will examine social systems and life-course strengths approaches to understand how families and couples function. Students will design interventions. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5183. Advanced Practice with Individuals. 3 Hours.

This course develops advanced skills in social work practice on a micro level. Students learn to analyze and compare practice models. They gain skills in selecting a practice model and integrating multiple models based on client needs. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5213. Advanced Practice in Behavioral and Mental Health. 3 Hours.

This advanced course prepares students to identify mental disorders, plan intervention strategies with clients from a strengths perspective, and understand mental health programs through which services are delivered. Differential diagnosis and the impact of socioeconomic status, gender, race, and sexual orientation on diagnosis and treatment decisions are addressed. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5243. The Diagnosis and Treatment of Substance Use Disorders. 3 Hours.

The Diagnosis and Treatment of Substance Use Disorders course will explore the use and abuse of drugs and alcohol with an emphasis on evidence-based treatment approaches to help engage and treat chemically dependent clients. Best practices to be reviewed will include Motivational Interviewing (MI), Cognitive Behavioral Therapy (CBT), harm reduction approaches, Medication Assisted Treatment (MAT), and Dialectical Behavioral Therapy (DBT). (Typically offered: Fall, Spring and Summer)

SCWK 5253. Spirituality and Social Work Practice. 3 Hours.

This course prepares students to respond competently and ethically to diverse spiritual and religious perspectives. Utilizing social work ethics and values as a guide, students will develop a comparative, critically reflective approach to practice. Prerequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103) or SCWK 5003 or SCWK 5013. (Typically offered: Fall and Spring)

SCWK 5263. Drug Policy and Its Impact on Approaches to Substance Use Disorder Treatment. 3 Hours.

The Drug Policy course will explore the history of drug policy within the United States, focusing on the relationship between people, drugs, and the criminalization of certain substances. This course will also examine how the War on Drugs has led to the collateral consequences of mass incarceration, racial discrimination in policy development and sentencing laws, and a treatment system that exists almost exclusively within the criminal justice system. Finally, this course will explore how other countries have developed and utilized harm reduction and decriminalization approaches and policies in order to shift treatment and financial resources from supply and enforcement to demand and treatment. (Typically offered: Fall, Spring and Summer)

SCWK 5273. Social Work Research and Technology I. 3 Hours.

(Formerly SCWK 4073.) An overview of forms and sources of social work research including existing social data, techniques for collecting original social data, and techniques of organization, interpretation, and presentation of data. Students will also become proficient in the use of current technology for social work research and practice. Graduate degree credit will not be given for both SCWK 4073 and SCWK 5273. Prerequisite: SCWK 4093 or SCWK 5093 (formerly SCWK 4093) and SCWK 4153 or SCWK 5353 (formerly SCWK 4153). Pre- or Corequisite: One of the following: STAT 2303, SOCI 3303 and SOCI 3301L, PSYC 2013, or ESRM 2403. (Typically offered: Fall and Spring)

SCWK 5333. Social Work Practice I. 3 Hours.

(Formerly SCWK 4333.) This is the first in the sequence of practice courses introducing students to the generalist approach to micro social work. This course focuses on developing a solid foundation for practice with individuals, including learning basic communication and helping skills, values, principles, and the connection of theory to practice. Graduate degree credit will not be given for both SCWK 4333 and SCWK 5333. Prerequisite: SCWK 4093 or SCWK 5093 (formerly SCWK 4093) and SCWK 4153 or SCWK 5353 (formerly SCWK 4153). Pre- or Corequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103). (Typically offered: Fall and Spring)

SCWK 5343. Advanced Practice with Groups. 3 Hours.

This course provides advanced knowledge, skills, and values needed to assess and intervene effectively with populations seen in the social work practice of group therapy. This course examines group dynamics, life-course and strengths perspectives, and client-centered assessment of needs and their application in agency settings. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5353. Social Welfare Policy. 3 Hours.

(Formerly SCWK 4153.) Describes and analyzes the policies and services rendered by local, state, regional, national, and international agencies as well as the policy implications for social work practice. Students prepare to advocate social policy changes designed to improve social conditions, promote social and economic justice, and to empower at-risk populations. Graduate degree credit will not be given for both SCWK 4153 and SCWK 5353. Prerequisite: COMM 1313, PLSC 2003, SCWK 2133, and SCWK 3193. (Typically offered: Fall and Spring)

SCWK 5412. Foundation Field Seminar. 2 Hours.

A required course for MSW students without an accredited undergraduate degree in social work. The purpose of the seminar is to allow students to integrate classroom content with experiences in the field, to learn peer supervision and consultation, and to learn from the experiences of other students in the field. Corequisite: SCWK 5434. (Typically offered: Spring and Summer)

SCWK 5434. Foundation Field Internship. 4 Hours.

This course is required of all graduate students entering the MSW program without an accredited undergraduate degree in social work. Minimum of 330 clock hours of agency-based professional social work practicum experience, supervised by a licensed MSW, is required. Corequisite: SCWK 5412. Prerequisite: SCWK 5003, SCWK 5333 (formerly SCWK 4333), SCWK 5273 (formerly SCWK 4073), SCWK 5093 (formerly SCWK 4093), and SCWK 5353 (formerly SCWK 4153). (Typically offered: Spring and Summer)

SCWK 5442. Field Seminar III. 2 Hours.

This seminar is required of all graduate students entering the MSW program with advanced standing. Students integrate classroom content with experiences in the field, learn peer supervision and consultation, and learn from the experience of other students in the field. Corequisite: SCWK 5444. Prerequisite: Admission to graduate program with advanced standing. (Typically offered: Summer)

SCWK 5444. Field Internship III. 4 Hours.

This course is required of all graduate students entering the MSW program with advanced standing. A minimum of 240 clock hours of agency-based professional social work practicum experience, supervised by a licensed MSW, is required. Corequisite: SCWK 5442. Prerequisite: Admission to graduate program with advanced standing. (Typically offered: Summer)

SCWK 5543. Social Work Practice II. 3 Hours.

(Formerly SCWK 4343.) This is the second course in the social work practice sequence, emphasizing theories, models, and techniques related to generalist practice with families and groups. The course elaborates on system theory as it impacts groups and families, and use of experiential teaching methods. Graduate degree credit will not be given for both SCWK 4343 and SCWK 5543. Prerequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103) and SCWK 4333 or SCWK 5333 (formerly SCWK 4333). (Typically offered: Fall and Spring)

SCWK 5733. Social Work Practice III. 3 Hours.

(Formerly SCWK 4733.) Students acquire and practice the skills, knowledge, and values necessary for culturally competent generalist social work practice with organizations and communities. Special attention is given to the implications of discrimination and oppression for attaining social and economic justice. Graduate degree credit will not be given for both SCWK 4733 and SCWK 5733. Prerequisite: SCWK 4333 or SCWK 5333 (formerly SCWK 4333). Pre- or Corequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103) and SCWK 4343 or SCWK 5543 (formerly SCWK 4343). (Typically offered: Fall and Spring)

SCWK 596V. Independent Study. 1-6 Hour.

Independent study designed to meet the particular needs of individual graduate students. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCWK 6000L. Thesis Laboratory. 0 Hours.

This laboratory is required for completion of the thesis, which is developed through components of the graduate Research & Technology sequence. Other courses in the graduate curriculum provide support for the conceptualization and development of the thesis. (Typically offered: Fall and Spring)

SCWK 6003. Advanced Social Work Practice Using the MSLC Perspective. 3 Hours.

Advanced Social Work Practice Using the Multi-Systems Life Course (MSLC) perspective teaches advanced practice behaviors with individuals, families, groups, organizations, and communities. This course focuses on integrating the arenas of advanced theory, research, policy practice, direct practice, required competencies and advanced practice behaviors using the MSLC perspective. Prerequisite: Admission into the advanced standing MSW program or completion of foundation courses. (Typically offered: Fall)

SCWK 6233. Advanced Social Work Practice With Children And Youth Using the MSLC Perspective. 3 Hours.

This course focuses on the development, revision, and impact of practice with children and youth from a Multi-Systems Life Course (MSLC) perspective. Historical trends as well as current practices will be examined with a focus on learning and improving social work practice skills. Prerequisite: SCWK 6003. (Typically offered: Spring)

SCWK 6243. Advanced Social Work Practice With Adults Using the MSLC Perspective. 3 Hours.

This course focuses on the development, revision, and impact of practice with adults from a Multi-Systems Life Course (MSLC) perspective. Historical trends as well as current practices will be examined with a focus on learning and improving social work practice skills. Prerequisite: SCWK 6003. (Typically offered: Spring)

SCWK 6442. Advanced Field Seminar I. 2 Hours.

The first of two advanced field seminars required of all students in the MSW program. The purpose of the seminar is to allow students to integrate classroom content with experiences in the field, to practice peer supervision and consultation, and to learn from the experiences of other students in the field. Corequisite: SCWK 6444. Prerequisite: SCWK 5412 or SCWK 5442. (Typically offered: Fall)

SCWK 6444. Advanced Field Internship I. 4 Hours.

This is the first of two advanced field internships required of all graduate students in the MSW program. A minimum of 330 clock hours of agency-based professional social work practicum experience, supervised by a licensed MSW, is required. Corequisite: SCWK 6442. Prerequisite: SCWK 5434 or SCWK 5444. (Typically offered: Fall)

SCWK 6452. Advanced Field Seminar II. 2 Hours.

This is the second of two advanced field seminars required of all students in the MSW program. The purpose of the seminar is to allow students to integrate classroom content with experiences in the field, to demonstrate peer supervision and consultation, and to learn from the experiences of other students in the field. Corequisite: SCWK 6454. Prerequisite: SCWK 6442. (Typically offered: Spring)

SCWK 6454. Advanced Field Internship II. 4 Hours.

This is the second of two advanced Field Internship courses required of all graduate students in the MSW program. A minimum of 330 clock hours of agency-based professional social work practicum experience supervised by a licensed MSW is required. Corequisite: SCWK 6452. Prerequisite: SCWK 6442. (Typically offered: Spring)

Sociology and Criminology (SOCl)

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Sociology and Criminal Justice Website (<https://fulbright.uark.edu/departments/sociology/>)

Degree Conferred:

M.A. in Sociology (SOCl)

Primary Areas of Faculty Research: Community; crime, health and well-being; terrorism; social inequality, organization and change; social data analytics using qualitative and quantitative methods.

Areas of Concentration: General sociology and criminology.

M.A. in Sociology with General Sociology Concentration

Application Requirements for the MA in Sociology Program:

Applicants for graduate studies in sociology must be admitted to the Graduate School and must also submit the following: 1) at least two letters of recommendation from people who can judge the applicant's academic potential as a graduate student; 2) a sample of written academic work (i.e., a research paper); 3) a one page statement in which the applicant discusses the educational objectives sought by entering our graduate program; 4) satisfactory GRE scores.

Prerequisites to Degree Program: Prior undergraduate work in social theory, research methods, statistics, and writing is considered necessary for successful performance at the graduate level. SOCl 3303 (or an approved equivalent), SOCl 3313 and SOCl 3423 (or an approved equivalent) are required to eliminate deficiencies. Additionally, students applying to the criminology concentration must show prior undergraduate work in introductory criminal justice or criminology. SOCl 3023/CRIM 3023 (or an approved equivalent) is required to eliminate deficiencies for students pursuing the criminology concentration. Undergraduate deficiencies must be removed by taking the appropriate undergraduate courses during the first twelve hours of graduate work or the first time the courses are offered.

Requirements for the Master of Arts Degree: (Minimum 32 hours.)

Core Requirements:

SOCI 5001	Proseminar	1
SOCI 5253	Classical Social Theory	3
SOCI 5311L	Applied Data Analysis Laboratory	1

SOCI 5313	Applied Data Analysis	3
SOCI 5013	Advanced Social Research	3

In addition to these common core courses, the courses required in a specific concentration, and the six hours of specialization-specific restricted electives, the student must take sufficient hours of electives to reach 32 semester hours total. The Department of Sociology and Criminology retains the right to make exceptions to the list of concentration-specific electives. Such exceptions must be approved by the Graduate Committee and authorized in writing by the Graduate Director. A maximum of three elective credit hours may be taken at the 4000 level without prior approval by the Graduate Committee. Students may apply three hours of independent study toward the degree provided that a research proposal is approved by the instructor prior to enrollment in the course. The student's adviser must authorize courses outside of the department. Except for rare circumstances, no more than three hours of credit outside of the department will count for the degree.

The Department of Sociology and Criminology offers a thesis and non-thesis option. Completion of the program for all students is contingent upon passing a comprehensive examination covering major course work.

Thesis Option: Students must take 26 hours of course work and six hours of thesis credit. All M.A. candidates in this option are required to develop and present a prospectus of the thesis to their thesis committee. They must also write and orally defend their thesis, including research methods, theory, and the area of thesis concentration.

Non-Thesis Option: Students must take 32 hours of course work. Students must select an area of study as listed in the departmental graduate handbook. Under this option, students must take a written comprehensive examination in theory, research methods, and the area of study.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.A. in Sociology with a concentration in General Sociology: In addition to meeting all of the core requirements outlined above, students wishing to pursue a master's degree in Sociology with a concentration in general sociology must complete the following courses:

Required Courses

SOCI 5263	Contemporary Social Theory	3
SOCI 5083	Applied Qualitative Research	3

Restricted Electives

Select two of the following:		6
SOCI 503V	Special Topics	
SOCI 5113	Seminar in Social Inequality	
SOCI 5133	The Community	
SOCI 5233	Theories of Deviance	

Total Hours 12

M.A. in Sociology with Criminology Concentration

Application Requirements for the MA in Sociology Program:

Applicants for graduate studies in sociology must be admitted to the Graduate School and must also submit the following: 1) at least two letters of recommendation from people who can judge the applicant's academic potential as a graduate student; 2) a sample of written academic work (i.e., a research paper); 3) a one page statement in which the applicant

discusses the educational objectives sought by entering our graduate program; 4) satisfactory GRE scores.

Prerequisites to Degree Program: Prior undergraduate work in social theory, research methods, statistics, and writing is considered necessary for successful performance at the graduate level. SOCI 3303 (or an approved equivalent), SOCI 3313 and SOCI 3423 (or an approved equivalent) are required to eliminate deficiencies. Additionally, students applying to the criminology concentration must show prior undergraduate work in introductory criminal justice or criminology. SOCI 3023/CRIM 3023 (or an approved equivalent) is required to eliminate deficiencies for students pursuing the criminology concentration. Undergraduate deficiencies must be removed by taking the appropriate undergraduate courses during the first twelve hours of graduate work or the first time the courses are offered.

Requirements for the Master of Arts Degree: (Minimum 32 hours.)

Core Requirements:

SOCI 5001	Proseminar	1
SOCI 5253	Classical Social Theory	3
SOCI 5311L	Applied Data Analysis Laboratory	1
SOCI 5313	Applied Data Analysis	3
SOCI 5013	Advanced Social Research	3

In addition to these common core courses, the courses required in a specific concentration, and the six hours of specialization-specific restricted electives, the student must take sufficient hours of electives to reach 32 semester hours total. The Department of Sociology and Criminology retains the right to make exceptions to the list of concentration-specific electives. Such exceptions must be approved by the Graduate Committee and authorized in writing by the Graduate Director. A maximum of three elective credit hours may be taken at the 4000 level without prior approval by the Graduate Committee. Students may apply three hours of independent study toward the degree provided that a research proposal is approved by the instructor prior to enrollment in the course. The student's adviser must authorize courses outside of the department. Except for rare circumstances, no more than three hours of credit outside of the department will count for the degree.

The Department of Sociology and Criminology offers a thesis and non-thesis option. Completion of the program for all students is contingent upon passing a comprehensive examination covering major course work.

Thesis Option: Students must take 26 hours of course work and six hours of thesis credit. All M.A. candidates in this option are required to develop and present a prospectus of the thesis to their thesis committee. They must also write and orally defend their thesis, including research methods, theory, and the area of thesis concentration.

Non-Thesis Option: Students must take 32 hours of course work. Students must select an area of study as listed in the departmental graduate handbook. Under this option, students must take a written comprehensive examination in theory, research methods, and the area of study.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

M.A. in Sociology with a concentration in Criminology: In addition to meeting all of the core requirements outlined above, students wishing to

pursue a master's degree in Sociology with a concentration in criminology must complete the following courses:

Required Course

SOCI 5413	Seminar in Criminological Theory	3
SOCI 5423	Research in Criminology	3

Restricted Electives

Select two of the following:		6
SOCI 5433	Victimization	
SOCI 5443	Seminar in Terrorism and Homeland Security	
SOCI 5453	Social Control	
SOCI 5473	Crime and Community	

Total Hours		12
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Graduate Faculty

Adams, Douglas James, Ph.D., M.A. (University of Arizona), Associate Professor, 1995.

Allison, Kayla, M.A. (University of Arkansas), B.A. (Indiana University-Bloomington), Instructor, 2020.

Barnum, Anthony Justin, Ph.D. (Howard University), M.A. (University of Arkansas), B.A. (Hendrix College), Visiting Assistant Professor, 2016.

Bustamante, Juan Jose, Ph.D. (Michigan State University), M.S., B.A. (University of Texas Pan American), Associate Professor, 2012.

Drawve, Grant R., Ph.D. (University of Arkansas at Little Rock), M.A., B.A. (Southern Illinois University), Assistant Professor, 2016.

Engen, Mindy Sue, Ph.D., M.A. (Pennsylvania State University), B.S. (Georgia State University), Professor, 2005.

Engen, Rodney L., Ph.D. (University of Washington), M.S., B.S. (University of Wisconsin-Milwaukee), Associate Professor, 2009.

Fitzpatrick, Kevin M., Ph.D. (State University of New York at Albany), M.A. (University of South Carolina at Columbia), B.A. (Susquehanna University), University Professor, 2005.

Gruenwald, Jeffrey A., Ph.D. (Michigan State University), Associate Professor, 2019.

Harris, Casey Taggart, Ph.D., M.A. (Pennsylvania State University), B.S. (Texas A&M University), Associate Professor, 2011.

Hearne, Brittany Nicole, Ph.D., M.A., (Vanderbilt University), B.S. (Texas A&M), Assistant Professor, 2018.

Holyfield, Lori C., Ph.D. (University of Georgia), M.A., B.S.E. (University of Arkansas), Professor, 1995.

Koski, Patricia, B.A., M.A., Ph.D. (Washington State University), Associate Professor, 1984.

Morimoto, Shauna, Ph.D., M.S. (University of Wisconsin-Madison), B.A. (University of Pittsburgh), Associate Professor, 2008.

Niño, Michael D., Ph.D. (University of North Texas), M.A., B.S. (West Texas A&M University), Assistant Professor, 2020.

Park, Kiwoong, Ph.D. (University of Albany), Assistant Professor, 2019.

Sabon, Lauren, Ph.D. (University of Tennessee-Knoxville), M.S./M.A. (Marshall University), B.S., B.A. (West Virginia University), Clinical Assistant Professor, 2014.

Schwab, Bill, Ph.D., M.A. (The Ohio State University), M.A. (University of Akron), B.A. (Miami University), University Professor, 1976.

Shields, Christopher A., Ph.D., J.D., M.A., B.A. (University of Arkansas), Clinical Assistant Professor, 2003.

Thomas, Shaun A., Ph.D., M.A. (Louisiana State University), B.A. (University of Akron), Associate Professor, 2015.

Worden, Steven K., Ph.D. (University of Texas at Austin), M.A., B.A. (Portland State University), Associate Professor, 1986.

Yang, Song, Ph.D., M.S. (University of Minnesota-Twin Cities), M.A. (Nankai University, China), B.A. (Branch College of Nankai, China), Professor, 2002.

Zajick, Anna, Ph.D. (Virginia Polytechnic Institute and State University), M.S., B.S. (University of Silesia, Poland), Professor, 1994.

Courses

SOCI 5001. Proseminar. 1 Hour.

An informal forum for graduate students and faculty to present and discuss ongoing research interests as well as the current state of the discipline. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 500V. Advanced Problems in Sociology. 1-3 Hour.

Individual research on problems or problem areas. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

SOCI 5013. Advanced Social Research. 3 Hours.

An examination of experimental and quasi-experimental designs used in the analysis of sociological data with focus upon appropriate units of analysis and design selection, sampling, interview techniques, and questionnaire construction. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall)

SOCI 503V. Special Topics. 1-6 Hour.

Designed to cover specialized topics not usually presented in depth in regular courses. Prerequisite: Graduate Standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SOCI 5083. Applied Qualitative Research. 3 Hours.

An introduction to research strategies including intensive interviewing, participant observational fieldwork, content analysis, historical analysis, and comparative research. Emphasis on the practical aspects of designing and executive research involving multiple methods of data gathering and analysis. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 5113. Seminar in Social Inequality. 3 Hours.

Major theories of stratification; types of stratification systems, comparisons of modern and traditional systems; emergent trends. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5133. The Community. 3 Hours.

A sociological analysis of the theory, methods and materials used in the study of the community. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5233. Theories of Deviance. 3 Hours.

A survey of major theories-classical, developmental, ecological, functionalist, conflict, subcultural, control, and phenomenological-explaining morally condemned differences in society. Particular emphasis is on practical implications of each perspective for policy and social control. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5253. Classical Social Theory. 3 Hours.

A survey of social theory up to the late 20th century. An introduction to the classical sociological themes that continue to inform research, analysis, and policy formation. Major issues will include the relationship between the individual and the community, and the sources of stability, conflict, and change. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 5263. Contemporary Social Theory. 3 Hours.

Analysis of contemporary social theories & major theoretical debates. Emphasis is on critical evaluation & application of theoretical perspectives to current social issues affecting families and communities. Prerequisite: Graduate standing. (Typically offered: Spring)

SOCI 5311L. Applied Data Analysis Laboratory. 1 Hour.

Provides instruction for data transformations required for the advanced statistical procedures used in the Statistical Package for the Social Sciences (SPSS). Also provides instruction in the use of advanced statistical procedures covered in SOCI 5313. Prerequisite: Graduate standing. (Typically offered: Spring)

SOCI 5313. Applied Data Analysis. 3 Hours.

Covers basic concepts and applications of the general linear model to a variety of sociological research issues and problems. Also provides an introduction to binary dependent and multivariate categorical data analysis for sociological research. Prerequisite: Graduate standing. Familiarity with statistical computer programs is assumed. (Typically offered: Spring)

SOCI 5413. Seminar in Criminological Theory. 3 Hours.

An examination of the causation of crime, focusing primarily on sociological theories. Prerequisite: Graduate standing. (Typically offered: Spring)

SOCI 5423. Research in Criminology. 3 Hours.

Examination of empirical research in criminology, focusing on methodological problems, strategies, and findings. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 5433. Victimization. 3 Hours.

Study of the causes, correlates, and consequences of victimization, focusing on theories of victimization and the role of victims in the criminal justice system. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5443. Seminar in Terrorism and Homeland Security. 3 Hours.

Examines the evolution of modern terrorism and homeland security, focusing primarily on the dynamics of American terrorist movements (ideologies, motives, and tactics). Social, political, and criminal justice responses to terrorism are also considered. (Typically offered: Spring)

SOCI 5453. Social Control. 3 Hours.

Study of sociological theories and research on formal social control, primarily institutional responses to criminal behavior. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5473. Crime and Community. 3 Hours.

Examination of how neighborhood structural characteristics and social organization affect crime, as well as how the presence of crime and disorder in a community can affect neighborhood social organization. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5503. Research Internship. 3 Hours.

Supervised research experience. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

SOCI 5603. Environmental Sociology. 3 Hours.

(Formerly SOCI 4603.) The course provides a social perspective on environmental issues. It examines the linkage between society, ecological systems and the physical environment. It provides conceptual framework(s) for analyzing environmental issues, considers the role of humans in environmental issues, and enhances understanding the complexity of the relationship between societal organization and environmental change. Graduate degree credit will not be given for both SOCI 4603 and SOCI 5603. (Typically offered: Spring)
This course is cross-listed with HDFS 5603.

SOCI 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Space and Planetary Sciences (SPAC)

Larry Roe
Graduate Coordinator
STON F50
479-575-3750
Email: lar@uark.edu

Space and Planetary Sciences Website (<http://spacecenter.uark.edu>)

Degree Conferred:

M.S., Ph.D. in Space and Planetary Sciences (SPAC)

Program Description: The program provides advanced course work and research experience for persons seeking a career in the academic, government, private, or military sectors of space and planetary sciences or associated technologies.

Primary Areas of Faculty Research: Astronomical processes, geological processes on planetary surfaces, planetary atmospheres, mission instrumentation and design, astrobiology, applications to Mars, Venus, Pluto, and ice worlds.

M.S. in Space and Planetary Sciences

Admission to Degree Program: Students wishing to apply for admission to the graduate degrees in space and planetary sciences should contact the Space and Planetary Science Center's graduate coordinator at jcdixon@uark.edu. Applicants should prepare to have transcripts, two letters of recommendation, and a statement of purpose sent to the center. Applicants are encouraged to submit scores from the Graduate Record Examination, including the writing score.

Basic Requirements for the Master's Degree: At least 24 semester hours of courses plus at least six hours of SPAC 600V are required for a total of at least 30 hours beyond the baccalaureate degree. Students are required to take the following courses:

Non-Core Courses

SPAC 5211	SPAC Proseminar	1
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Core Courses

Select three of the following:	3
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SPAC 5033	Astrophysics I: Stars and Planetary Systems	
SPAC 5313	Planetary Atmospheres	
SPAC 5413	Planetary Geology	
SPAC 5553	Astrobiology	
SPAC 5613	Astronautics	

Space and Planetary Electives

(see list below) - Must take at least three courses (10 hours).
Substitutions may be made with the approval of the committee.

Other Electives

SPAC 5161	Seminar (must take every semester)	4
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Thesis

SPAC 600V	Master's Thesis	6
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Total Hours	24
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NOTE: The student's committee consists of at least four faculty members; at least three of these must be from the space center faculty, drawn from three different departments, and these must include the graduate advisor and the chair of the committee. One member of the committee should be from outside of the space center.

Every student must register for a minimum of one credit hour of SPAC 600V or 700V in each term during which the student is away from campus and doing thesis or dissertation research. The number of 4000-level courses allowed in a program is limited to two and committee approval is required.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Ph.D. in Space and Planetary Sciences

Admission to Degree Program: Students wishing to apply for admission to the graduate degrees in space and planetary sciences should contact the Space and Planetary Science Center's graduate coordinator at jcdixon@uark.edu. Applicants should prepare to have transcripts, two letters of recommendation, and a statement of purpose sent to the center. Applicants are encouraged to submit scores from the Graduate Record Examination, including the writing score.

Requirements for the Doctor of Philosophy Degree: Students are required to take a minimum of 72 hours beyond the baccalaureate degree or 42 hours beyond the master's degree to include a minimum 33 hours of required course work and 18 hours of SPAC 700V. Course requirements are given below.

Non-Core Courses

SPAC 5161	Seminar	8
SPAC 5211	SPAC Proseminar	1
SPAC 5123	Internship	3

Core Courses

Select four of the following:	12
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SPAC 5033	Astrophysics I: Stars and Planetary Systems	
SPAC 5313	Planetary Atmospheres	
SPAC 5413	Planetary Geology	
SPAC 5553	Astrobiology	
SPAC 5613	Astronautics	

Space and Planetary Electives

Choose at least three courses from the list below. Substitutions may be made with the approval of the committee.

ASTR 5043	Astrophysics II: Galaxies and the Large-Scale Universe	9
ASTR 5073	Cosmology	
BIOL 5003L	Laboratory in Prokaryote Biology	
BIOL 5263	Cell Physiology	
BIOL 5233	Genomics and Bioinformatics	
BIOL 5353	Ecological Genetics/genomics	
BIOL 5463	Physiological Ecology	
CHEM 5813	Biochemistry I	
CHEM 5843	Biochemistry II	
CSCE 5043	Advanced Artificial Intelligence	
ELEG 5243L	Microelectronic Fabrication Techniques and Procedures	
ELEG 5273	Electronic Packaging	
ELEG 5553	Switch Mode Power Conversion	
ELEG 5903	Engineering Technical Writing	
GEOS 5113	Global Change	
GEOS 5253	Geomorphology	
GEOS 5273	Principles of Geochemistry	
GEOS 5293	Introduction to Global Positioning Systems and Global Navigation Satellite Systems	
GEOS 5363	Climatology	
GEOS 5563	Tectonics	
GEOS 5653	GIS Analysis and Modeling	
MEEG 5403	Advanced Thermodynamics	
MEEG 5833	Aerospace Propulsion	

PHYS 5363	Scientific Computation and Numerical Methods	
PHYS 5513	Atomic and Molecular Physics	
PHYS 5653	Subatomic Physics	
SPAC 5033	Astrophysics I: Stars and Planetary Systems	
SPAC 5313	Planetary Atmospheres	
SPAC 5413	Planetary Geology	
SPAC 5553	Astrobiology	
SPAC 5613	Astronautics	
Other courses may count as electives with the approval of the student's research adviser and committee.		
Dissertation		
SPAC 700V	Doctoral Dissertation	18
Total Hours		51

Additional Requirements: Students are required to complete a thesis or dissertation describing original research work in the space and planetary sciences that must be presented to and successfully defended before their committee. In addition, Ph.D. students must pass a candidacy examination.

The Ph.D. candidacy examination is administered by the student's committee and is designed to test the student's ability to assimilate, integrate and interpret material learned in the core required courses while at the same time having a depth of understanding in the area of the student's research. Thus, the candidacy examination will be in two parts:

(1) a 2,500-word integrative essay on a theme chosen by the committee, and (2) an oral defense of the thesis before the committee. Part (1) will be assigned six weeks before the candidacy defense and shall be presented to the committee two weeks before that defense. The defense will be held at a date determined by the committee but usually before the end of the student's second year in graduate school. The committee will judge the examination as pass/fail and in the case of failure – and at the discretion of the committee – a second attempt to pass the qualifying examination is permitted within a period of time determined by the committee.

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Boss, Steve K., Ph.D. (University of North Carolina at Chapel Hill), M.S. (Utah State University), B.S. (Bemidji State University), Professor, Department of Geosciences, 1996.

Chevrier, Vincent Francois, Ph.D. (CEREGE, Aix-en-Provence, France), M.E.S. (University Paris VII), B.S. (Academy of Versailles, France), Research Associate Professor, Department of Chemistry and Biochemistry, 2005.

Dixon, Bruce Lawrence, Ph.D., M.S. (University of California-Davis), B.A. (University of California-Santa Barbara), Professor, Department of Agricultural Economics and Agribusiness, 1984.

Huang, Po-Hao Adam, Ph.D., M.S., B.S. (University of California-Los Angeles), Associate Professor, Department of Mechanical Engineering, 2006.

Ivey, Mack, Ph.D., B.S. (University of Georgia), Associate Professor, Department of Biological Sciences, 1992.

Kennefick, Daniel John, Ph.D., M.A. (California Institute of Technology), B.S. (University College Cork, Ireland), Associate Professor, Department of Physics, 2004.

Kennefick, Julia Dusk, Ph.D. (California Institute of Technology), B.S. (University of Arkansas), Associate Professor, Department of Physics, 2003.

Kral, Timothy Alan, Ph.D. (University of Florida), B.S. (John Carroll University), Professor, Department of Biological Sciences, 1981.

Mantooth, Alan, Ph.D. (Georgia Institute of Technology), M.S., B.S. (University of Arkansas), Distinguished Professor, Department of Electrical Engineering, 1998.

Oliver, William, Ph.D., M.S. (University of Colorado-Boulder), B.S. (University of Arizona), Associate Professor, Department of Physics, 1992.

Roe, Larry, Ph.D. (University of Florida), M.S., B.S.M.E. (University of Mississippi), Associate Professor, Department of Mechanical Engineering, 1994.

Tullis, Jason A., Ph.D., M.S. (University of South Carolina at Columbia), B.S. (Brigham Young University), Professor, Department of Geosciences, 2004.

Courses

SPAC 5033. Astrophysics I: Stars and Planetary Systems. 3 Hours.

Stellar structure and evolution, the properties of the solar system, and extrasolar planetary systems. (Typically offered: Fall Odd Years)

This course is cross-listed with ASTR 5033.

SPAC 5111L. Space and Planetary Lab. 1 Hour.

Laboratory course in space and planetary sciences consisting of experiments in the five major areas of space and planetary sciences: planetary astronomy, planetary geology, planetary atmospheres, origin and evolution of life and orbital mechanics and astronautics. Intended for students enrolled in the graduate programs in space and planetary sciences. (Typically offered: Fall)

SPAC 5123. Internship. 3 Hours.

Internship for graduate students in the space and planetary sciences graduate degree programs and concentrations in the graduate programs in physics, biology, geosciences and mechanical engineering. Students conduct a phase of their research, normally for one month, at a national or industrial laboratory in North America or overseas. (Typically offered: Fall and Spring)

SPAC 5161. Seminar. 1 Hour.

Seminars organized by the Center for Space and Planetary Sciences covering topics on the cutting edge of research in the field for graduate students conducting research with a faculty member in the space and planetary sciences as part of their graduate degree programs or concentrations in the graduate programs in physics, biology, geology, geography and mechanical engineering. (Typically offered: Fall and Spring)

SPAC 5211. SPAC Proseminar. 1 Hour.

Introductory course consisting of discourses and case studies in ethics, communications and public policy in the administration of space and planetary sciences. Prerequisite: Admission to program or instructor consent. (Typically offered: Spring)

SPAC 5313. Planetary Atmospheres. 3 Hours.

Origins of planetary atmospheres, structures of atmospheres, climate evolution, dynamics of atmospheres, levels in the atmosphere, the upper atmosphere, escape of atmospheres, and comparative planetology of atmospheres. (Typically offered: Irregular)

SPAC 5413. Planetary Geology. 3 Hours.

Exploration of the solar system, geology and stratigraphy, meteorite impacts, planetary surfaces, planetary crusts, basaltic volcanism, planetary interiors, chemical composition of the planets, origin and evolution of the Moon and planets. (Typically offered: Spring Even Years)

SPAC 5553. Astrobiology. 3 Hours.

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth, possibility of life elsewhere in the solar system (including Mars), and the possibility of life on planets around other stars. Prerequisite: Instructor consent. (Typically offered: Spring Even Years) This course is cross-listed with BIOL 5553.

SPAC 5613. Astronautics. 3 Hours.

Study of spacecraft design and operations. Prerequisite: Admission to program or instructor consent. (Typically offered: Irregular)

SPAC 600V. Master's Thesis. 1-10 Hour.

Master's thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

SPAC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Spanish

Steve Bell

Chair, Department of World Languages, Literatures and Cultures
425 Kimpel Hall
479-575-2951
Email: sbell@uark.edu

Erika Almenara

Graduate Coordinator of Spanish
425 Kimpel Hall
479-575-2951
Email: a (rruiz@uark.edu)lmenara@uark.edu

Degree Conferred:

M.A. in Spanish (SPAN)

Program Description: Students pursuing the M.A. degree in Spanish will choose to follow one of two concentrations.

The first concentration is a traditional M.A. in Hispanic literature and culture with a strong emphasis on literary analysis. This concentration is recommended for students likely to pursue work toward a Ph.D. in literature and cultural studies after completion of the M.A.

The second concentration provides students an alternative track that places more emphasis on coursework in pedagogy, technology in the classroom, and second-language acquisition. This concentration is recommended more for students interested in language teaching, for students who may use the M.S. as a terminal degree in preparation for community college or liberal arts teaching, or for secondary teachers seeking further professional development.

M.A. in Spanish

Admission into the Master of Arts in Spanish Program: Admission to the M.A. program in Spanish requires a Bachelor of Arts degree or the equivalent from an accredited institution with suitable preparation in Spanish. Individuals interested in a teaching assistantship should submit an application for graduate assistantship to the Department of World Languages, Literatures and Cultures by February 1. In order to demonstrate oral and written proficiency in Spanish, English speakers applying for a teaching assistantship must send an audio-recorded reading of a literary text in Spanish as well as a writing sample in Spanish on a subject of the applicant's choosing (4-8 pages). Applicants requesting an assistantship must also include three letters of recommendation and a statement of purpose.

Upon admission to the program, the candidate will be assigned an adviser who, in consultation with the candidate, will design a suitable program for the candidate, following these guidelines. The adviser, in consultation with other members of the department, will select an examination committee for the comprehensive oral and written examinations. M.A. comprehensive exams can be taken only two times.

Non-native English speakers applying to the program, and those applying for teaching assistantships, should be sure to consult the English-language admission requirements for both graduate students and teaching assistants at:

- Graduate School English Proficiency page (<https://international-admissions.uark.edu/graduate-studies/english-proficiency.php>)
- Graduate School Admissions page (<http://catalog.uark.edu/graduatecatalog/admissions/>)

Detailed program descriptions, including reading lists and examination procedures, are available from the department.

Students pursuing the Master of Arts in Spanish will choose one of two concentrations. The first concentration is a traditional M.A. in Hispanic literature and culture with a strong emphasis on literary analysis. This concentration is recommended for students likely to pursue work towards a Ph.D. in literature and cultural studies after the completion of the M.A. The second concentration provides students with an alternative to the traditional M.A. in Hispanic literature and culture that places an additional emphasis on coursework in second language acquisition and language teaching. This concentration is recommended for students interested in pursuing a Ph.D. in Spanish applied linguistics after the completion of the M.A., and for those who are interested in language teaching as a career.

Requirements for the Master of Arts in Spanish: Aside from deficiencies, a minimum of 36 graduate credit hours is required for the degree. During their first semester, all students must take WLLC 5063 Teaching Foreign Languages on the College Level. In addition, 24 credit hours of Spanish literature at the 5000-level or higher is required. The remaining 9 credit hours comes from one of two concentrations listed below.

Literature concentration: Students will take SPAN 5703 Special Topics (in literature) or an equivalent research seminar, as approved by the graduate advisor. In this course, students will be required to present a research paper that meets professional research methods and standards. Students will also take an additional 6 credit hours in literature.

The comprehensive examination for the Literature concentration will include five areas of focus. This includes two periods from each tradition (Latin America and Spain) and at least two periods before 1900. The periods of concentration are Colonial, 19th century, 20th/21st century, and U.S. Latino/a for Latin America, and Medieval, Golden Age, 19th century, and 20th/21st century for Spain.

Language Learning and Teaching concentration: Students will take SPAN 5703 Special Topics (in language learning and teaching) or an equivalent research seminar, as approved by the graduate advisor. In this course, students will be required to present a research paper that meets professional research methods and standards. Students will also take an additional 6 credit hours in language learning and teaching.

For the Language Learning and Teaching concentration, the comprehensive examination will include five areas of focus. One area will be language learning and teaching. The four others will consist of

literature and culture from four historical periods of the Hispanic world, including at least one period from each tradition (Latin America and Spain) and at least one period before 1900. The periods of concentration are Colonial, 19th century, 20th/21st century, and U.S. Latino/a for Latin America, and Medieval, Golden Age, 19th century, and 20th/21st century for Spain.

Literature Concentration

Requirements for the Spanish M.A. Literature Concentration:

6 credit hours of additional Spanish literature at the 5000-level or higher	6
SPAN 5703 Special Topics (in literature) or an equivalent research seminar in literature, as approved by the graduate advisor	3
Total Hours	9

Language Learning and Teaching Concentration

Requirements for the Spanish M.A. Language Learning and Teaching Concentration:

6 credit hours of additional language learning and teaching courses	6
SPAN 5703 Special Topics (in language learning and teaching) or an equivalent research seminar in language learning and teaching, as approved by the graduate advisor	3
Total Hours	9

Courses

SPAN 5073. Introduction to Hispanic Linguistics. 3 Hours.

Deepens students' knowledge of the Spanish language through an introduction to the discipline of Linguistics, which is the field of science that studies human language. Areas of Hispanic linguistics that will be covered include phonology (sound system), morphology (word structure), and syntax (sentence structure). (Typically offered: Irregular)

SPAN 5203. Medieval Spanish Literature. 3 Hours.

From the 'Jarchas' to the Celestina. (Typically offered: Irregular)

SPAN 5233. Golden Age Novel. 3 Hours.

Major works of Spanish prose fiction from the 16th and 17th centuries, with close reading of major works. (Typically offered: Irregular)

SPAN 5243. Golden Age Poetry and Drama. 3 Hours.

History and development of those genres in the 16th and 17th centuries, with close reading of major works. (Typically offered: Irregular)

SPAN 5253. Colonial Literature and Culture. 3 Hours.

An introductory course to the history, culture and literature of colonial Spanish America from 1492 until 1810. The course will cover representative colonial and indigenous texts and their contexts including Renaissance, Baroque, and travel literature of the Eighteenth Century. The course will be taught in Spanish. (Typically offered: Irregular)

SPAN 5273. Survey of 19th Century Spanish Literature. 3 Hours.

A graduate-level survey of Spanish literature from Neoclassicism to the Generation of 1898. (Typically offered: Irregular)

SPAN 5283. Survey of Contemporary Spanish Literature. 3 Hours.

A graduate-level survey of Spanish literature from the Transition to the present. (Typically offered: Irregular)

SPAN 5343. Survey of 20th Century Spanish Literature. 3 Hours.

A graduate-level survey of Spanish literature from the Generation of 1898 to the Transition. Prerequisite: Graduate standing. (Typically offered: Irregular)

SPAN 5393. 19th Century Spanish American Literature. 3 Hours.

Study of representative literary works from Independence (1810) to 1900's. The course covers Neoclassicism, Romanticism, Realism/Naturalism, and Modernism and the role of literature in the nation-building process. The course will be taught in Spanish. (Typically offered: Irregular)

SPAN 5403. Spanish American Theatre. 3 Hours.

Historical examination of the theatre in Spanish America, with close analysis particularly of representative works and movements in the 20th century. (Typically offered: Irregular)

SPAN 5463. 20th Century Spanish American Literature. 3 Hours.

Critical survey of major movements and outstanding and representative works in 20th century prose and poetry, from the Mexican Revolution and the avant-garde to the contemporary boom and post-boom. (Typically offered: Irregular)

SPAN 5563. Latino Youth Bilingual Service Learning Project. 3 Hours.

The Latino Youth Bilingual Project is a service learning course for students in Spanish and Latin American and Latino Studies. Readings on Latino education policies and challenges, bilingualism, and the immigrant experience. Students commit from 15 to 30 hours of mentoring Latino youth at local schools during the semester (in addition to class meeting times) and complete a research project on Latino education. Prerequisite: Graduate standing. (Typically offered: Irregular)

SPAN 5703. Special Topics. 3 Hours.

May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SPAN 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

SPAN 5773. Indigenismo Literature. 3 Hours.

A study of 'indigenismo', an intellectual and literary tradition in Latin America examining the history of exploitation and marginalization of indigenous peoples. Readings include texts by Mariategui, Icaza, Andrade, Asturias, Arguedas, Castellanos, and also 'indigenista' works in music and the plastic arts. (Typically offered: Irregular)

SPAN 5943. U.S. Latino/a Literatures and Cultures. 3 Hours.

Explores the construction and negotiation of Latino/a identities through the study of literary and filmic texts. Theoretical concepts (e.g. latinidad, latinization, intra-latino, cultural remittances) will also be studied. Topics of discussion may include: transnationalism, bilingualism, and interactions between different Latino groups. Taught in Spanish. Prerequisite: Graduate standing. (Typically offered: Irregular)

Special Education (SPED)

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Degree Conferred:

M.Ed. in Special Education (SPED)

Graduate Certificates Offered (non-degree):

Applied Behavior Analysis (APBA)
Autism Spectrum Disorders (AUTS)
Special Education Transition Services (SPTS)

Program Description: The coursework for the M.Ed. in Special Education program prepares teachers to work with students with disabilities from kindergarten through grade 12 by building competencies and knowledge expected within the field of Special Education. Two special education licensure options are available: an M.Ed. leading to initial license and an M.Ed. leading to endorsement. The M.Ed. in Special Education is an on-line program, allowing students the opportunity to pursue educational goals at a time and place that fits their individual schedules. The practicum courses take place in public schools across the United States.

Special Education graduate certificates and other Arkansas Department of Education endorsements (such as Gifted, Dyslexia, Educational Examiner, Resource Room, Special Education) offered by the special education program can be embedded into the Special Education master's degree program. The College of Education and Health Professions provides the coursework needed for successful teacher candidates to submit a request for the special education license or endorsement from the Arkansas Department of Education. Prospective students not residing in Arkansas must check their own state's requirements and reciprocity agreements. Nationally recognized faculty provide the instruction for the program.

M.Ed. in Special Education

Admission Requirements for the Master of Education in Special Education:

- A bachelor's degree from an accredited institution of higher education. For prospective students with a bachelor's degree in a field outside education the M.Ed. with initial license is necessary. For those students with bachelor's degree in education (e.g., early childhood education, secondary education) the M.Ed. with endorsement is appropriate.
- A minimum 3.0 cumulative grade point average (GPA) during the last 60 hours of undergraduate work
- For the Special Education Master of Education Program a Praxis Core Exam, GRE, or other approved Standardized Core Knowledge Test is required.
- Three reference letters
- A statement of purpose and resume/curriculum vitae
- Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451). Applicants must meet all requirements for admission to the University of Arkansas Graduate School, except the standardized test score requirement.

Requirements for the Master of Education in Special Education:

Minimum of 36 graduate semester credit hours.

SPED 5413	ABA and Classroom Management for Teachers	3
SPED 5633	Curriculum Development and Instructional Planning ¹	3
	or SPED 6873 Measurement and Experimental Design	
	or ESRM 5013 Research Methods in Education	
	or ESRM 5393 Statistics in Education and Health Professions	
SPED 5683	Teaching Literacy Skills to Students with Disabilities	3
SPED 5733	Inclusive Practices for Diverse Populations	3

SPED 5673	Teaching Students with Disabilities in the Content Areas	3
SPED 5763	Teaching Individuals with Severe Disabilities	3
SPED 5783	Professional and Family Partnerships	3
SPED 5873	Assessment and Programming for Students with Disabilities	3
SPED 6433	Legal Aspects of Special Education	3
SPED 6803	Teaching Students with Autism Spectrum Disorders ²	3
	or SPED 5883 Research in Inclusive Education	
SPED 532V	Practicum in Special Education (total of 6 hrs of SPED532V required in K-6 and 7-12)	6
Total Hours		36

¹ Students seeking M.Ed. with initial license take SPED 5633. Students seeking M.Ed. with endorsement take SPED 6873, ESRM 5013, or ESRM 5393.

² Students seeking M.Ed. with initial license take SPED 6803. Students seeking M.Ed. with endorsement take SPED 5883.

Students should also be aware of the general Graduate School requirements (p. 451) for the M.Ed. Degree.

Graduate Certificate Program in Applied Behavior Analysis (APBA):

The Graduate Certificate in Applied Behavior Analysis is for those individuals who wish to pursue board certification in behavior analysis. The program builds on candidate's previous knowledge of behavior strategies and extends knowledge and skills in the use of applied behavior analysis. Classes emphasize the development and ethical use of behavior change programs that are validated by systematic evaluation of the interventions used. Ethical, professional, and legal standards are discussed and used in relation to applied behavior analysis.

Admission requirements for the graduate certificate program include: A minimum 3.00 cumulative GPA during the last 60 hours of undergraduate work.

Program of Study

SPED 6843	Basic Principles of ABA	3
SPED 6853	Behavioral Assessment in ABA	3
SPED 6863	Behavior Change Procedures and Supports	3
SPED 6873	Measurement and Experimental Design	3
SPED 6883	ABA Ethical, Professional, and Legal Standards	3
SPED 6453	Human Performance Improvement	3
SPED 6463	Concepts and Principles in Behavior Analysis	3
Total Hours		21

Candidates for the graduate certificate must have a B or higher in the program of study. Courses from other institutions will not be substituted for the required courses. The Graduate Certificate in Applied Behavior Analysis can be infused into the Master of Special Education degree program.

Graduate Certificate in Autism Spectrum Disorders

Graduate Certificate Program in Autism Spectrum Disorders (AUTS):

The graduate certificate in Autism Spectrum Disorders develops professionals in the area of autism spectrum disorders. The program recognizes students who take a concentrated core of courses focused on autism spectrum disorders. Students who earn the certificate develop knowledge and skills in the areas of characteristics, assessment, and educational interventions for individuals with autism spectrum disorders.

Admission requirements for the Graduate Certificate program include:

- A minimum of a 3.0 cumulative grade point average (GPA) during the last 60 hours of undergraduate work.

Program of Study:

SPED 5143	Teaching Communication Skills to Persons with Autism	3
SPED 6803	Teaching Students with Autism Spectrum Disorders	3
SPED 6813	Characteristics and Assessment of Persons with ASD	3
SPED 6823	Instructional Methods for Students with Autism Spectrum Disorders	3
SPED 6833	Practicum in Autism Spectrum Disorders	3

Special Education Transition Services Graduate Certificate is designed to prepare school-based professionals (social workers, school psychologists, educational leaders, school counselors, special education teachers, and general education teachers) to provide transition services to students with disabilities. To be admitted, applicants must have a 3.0 GPA or higher in their last 60 hours of course work.

SPED 5713	Career Development and Transition for People with Disabilities	3
SPED 5763	Teaching Individuals with Severe Disabilities	3
SPED 5783	Professional and Family Partnerships	3
SPED 6433	Legal Aspects of Special Education	3
SPED 532V	Practicum in Special Education	3
Total Hours		15

Curriculum and Instruction Courses

CIED 5003. Elementary Education Seminar. 3 Hours.

This course is designed to synthesize the foundational content presented in the Master of Arts in Teaching core courses. It focuses on refinement of the generalized knowledge to accommodate specialized content children. Professional attitudes, knowledge and skills relevant to elementary students. Professional attitudes, knowledge and skills applicable to today's elementary educator are addressed. Prerequisite: Admission to the CHED M.A.T. (Typically offered: Spring)

CIED 5013. Measurement, Research and Statistical Concepts in the Schools. 3 Hours.

An introduction to constructing, analyzing, and interpreting tests; types of research and the research process; qualitative and quantitative techniques for assessment; and descriptive and inferential statistics. Prerequisite: Admission to graduate school. (Typically offered: Summer)

CIED 5022. Classroom Management Concepts. 2 Hours.

A number of different classroom management techniques are studied. It is assumed that a teacher must possess a wide range of knowledge and skills to be an effective classroom manager. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5032. Curriculum Design Concepts for Teachers. 2 Hours.

The design and adaptation of curriculum for students in regular and special K-6 classrooms. Theoretical bases and curriculum models are reviewed. Concurrent clinical experiences in each area of emphasis are included. Prerequisite: Admission to the M.A.T. program. (Typically offered: Spring)

CIED 5053. Multicultural Issues in Elementary Education. 3 Hours.

This course provides an introduction to the major concepts and issues related to multicultural education in elementary classrooms. The ways in which race, class, gender and exceptionality influence students' behavior are discussed. Prerequisite: Admission to graduate school. (Typically offered: Spring Odd Years; Summer)

CIED 5063. Disciplinary and Interdisciplinary Literacies in Education. 3 Hours.

This course teaches the integration of reading, writing, and new literacies within the discipline and across disciplines. Theory and strategy are presented as integrated strands of the language process as presented in the context of instructional principles and suggested teaching practices. A solid research base is emphasized while keeping the focus on practical application. Prerequisite: Admission to Teacher Education M.A.T. Program. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

CIED 5073. Action Research in Elementary Education. 3 Hours.

Provides the students with experience in conducting case studies and action research related to childhood education. In addition, students gain knowledge regarding practices used in ethnographic research. Prerequisite: Admission to M.A.T. program. (Typically offered: Spring)

CIED 508V. Elementary Education Cohort Teaching Internship. 1-6 Hour.

Full-time student teaching in grades K-6 to be repeated both fall and spring semesters. Students will practice and master instructional strategies under the supervision of qualified mentor teachers and university faculty members. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 5153. Creativity in Daily Practice. 3 Hours.

(Formerly CIED 4083.) Arts integration course including the ideas, design, and implementation of practices in the classroom, board room, and professional field that enrich the experiences of all stakeholders while building right-brain thinking skills for the new millennium. Graduate degree credit will not be given for both CIED 4083 and CIED 5153. (Typically offered: Spring Even Years) May be repeated for up to 6 hours of degree credit.

CIED 5162. Applied Practicum. 2 Hours.

Provides laboratory experiences for CIED 5173 (Literacy Assessment and Intervention). Corequisite: CIED 5173. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5173. Literacy Assessment and Intervention. 3 Hours.

Focuses on assessment of young children's literacy skills. Techniques discussed include informal observation, miscue analysis, and portfolio assessment. Prerequisite: Admission to graduate school. (Typically offered: Fall and Summer)

CIED 5203. English Language Arts/Speech & Drama Methods of Instruction. 3 Hours.

This course provides an introduction to teaching English language arts (ELA) and speech/drama in the context of elementary, middle and high school settings. The topics, issues, methods, and materials encompassing philosophical, cognitive, and psychological dimensions of teaching the content area provide the major tenets of instruction. (Typically offered: Summer)

CIED 5213. Issues and Trends in Literacy. 3 Hours.

This course provides an examination of practices to teaching literacy, broadly defined. The topics, issues, methods, and materials encompassing philosophical, cognitive, and psychological dimensions of teaching provide the major tenets of instruction. Prerequisite: Admission to M.A.T. (EDUCMA) Secondary program or instructor consent. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

CIED 5223. Learning Theory. 3 Hours.

This course provides the student with information about foundational issues in education, including history and philosophy of American Education, psychological and social theories of education, characteristics of learners, and learning processes. Prerequisite: Admission to M.A.T. degree program. (Typically offered: Summer)

CIED 5232. Interdisciplinary Studies. 2 Hours.

Introduction to the nature of interdisciplinary study: curricular content, course planning (topics and themes), instructional strategies, and evaluation and assessment. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall, Spring and Summer)

CIED 5243. The Moral Mind in Action. 3 Hours.

(Formerly CIED 4433.) The Moral Mind in Action explores how people reason through moral dilemmas and prepares students to more effectively recognize and resolve moral problems. Best practices of teachers and administrators of K-16 character education programs are discussed. Graduate degree credit will not be given for both CIED 4433 and CIED 5243. (Typically offered: Fall)

CIED 5253. Moral Courage. 3 Hours.

(Formerly CIED 4443.) Moral Courage explores the factors that support translating moral thinking into moral action. This course draws from the field of positive psychology to guide students as they leverage existing strengths and develop new strategies for acting with moral courage in their personal and professional lives. Best practices of teachers and administrators of K-16 character education programs are discussed. Graduate degree credit will not be given for both CIED 4443 and CIED 5253. (Typically offered: Spring)

CIED 5263. Assessment, Evaluation, and Practitioner Research. 3 Hours.

A study of assessment, testing, and evaluative procedures in classrooms including types of tests, abuses of tests, test construction, scoring, analysis and interpretation, statistical methods, and alternative evaluation and assessment techniques. Classroom-based data collection and analysis. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5273. Research in Curriculum and Instruction. 3 Hours.

An introduction to inquiry and research in curriculum and instruction. It examines the principles, strategies, and techniques of research, especially qualitative inquiry. Qualitative method in assessment and evaluation are considered. Practicum in educational research and evaluation is done as part of the class. (Typically offered: Fall)

CIED 528V. Teaching Experience. 1-6 Hour.

The teaching experience is an essential component of the Masters of Arts in Teaching degree. The two semester experience allows Teacher Candidates (TC) to make further application of theoretical principles of teaching and learning. Teacher Candidates will be assigned placement in area schools for both fall and spring semesters. The fall semester consists of a field experience including observation, co-planning, and co-teaching. The spring semester consists of an immersion experience for teacher candidates to plan and teach independently. Prerequisite: Admission to the M. A. T. Program (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 5313. Principles of Qualitative Research in Curriculum & Instruction. 3 Hours.

Designed specifically for aspiring qualitative researchers who wish to conduct research in settings unique to curriculum and instruction. Methods of research design, data analysis, and writing for publication will be emphasized. Strongly recommended for graduate students who are considering a qualitative thesis or dissertation in curriculum and instruction. (Typically offered: Spring Odd Years)

CIED 5333. Curriculum Theory and Development for Educators. 3 Hours.

The design and adaptation of curriculum for students in regular and special K-12 classrooms. Theoretical bases and curriculum models are reviewed. Concurrent clinical experiences in each area of emphasis are included. Prerequisite: Admission to the M.A.T. program. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

CIED 5363. Teaching in K-12 Online and Blended Classrooms. 3 Hours.

The study of curriculum, instructional methods and assessment techniques to facilitate student learning in K-12 virtual and blended teaching environments. Students enrolled in the course will be required to demonstrate knowledge of prevalent and relevant models of K-12 curriculum, web-based instructional methods, assessment techniques and utilize tools for the development and implementation of effective instruction in the K-12 virtual classroom. Prerequisite: Graduate standing. (Typically offered: Fall)

CIED 5393. Introduction to Linguistics. 3 Hours.

This course is an introduction to human language. The goal is to understand what it means to speak a language, including an introduction to phonetics and phonology (specifically the sound system of American English), morphology (the rules of English at the word level), syntax (rules that govern sentence level language), semantics (meanings of words) and sociolinguistics (or the study of language use in its social context). (Typically offered: Fall)

CIED 5423. Curriculum and Instruction: Models and Implementation. 3 Hours.

The study of models of curriculum and instruction and their implementation to facilitate student learning in a variety of instructional environments. (Typically offered: Spring)

CIED 5443. Methods of Teaching Foreign Language K-12. 3 Hours.

Study of the methods and materials in the teaching of foreign language in K-12 settings as well as the theories of second language acquisition. Includes philosophical, cognitive, and psychological dimensions of teaching foreign languages. The planning of instruction, microteaching, and the development of instructional materials are included. Prerequisite: Admission to the MAT program. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

CIED 5453. Evaluation Techniques. 3 Hours.

Evaluation of learning using traditional means of assessment as well as alternative or authentic assessment techniques. (Typically offered: Irregular)

CIED 5461. Capstone Research Seminar. 1 Hour.

This course provides students with basic knowledge and practical skills in understanding, utilizing and implementing a research design project with a focus in the discipline of curriculum and instruction with particular emphasis of some aspect of teaching and/or learning. As a part of this course students will design, conduct and report the results of an action research study undertaken in the teaching internship. Prerequisite: Admission to M.A.T. program. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

CIED 5513. Sound System of American English. 3 Hours.

This course will study the structure and development of American English (AE). Topics include: 1) the structure/systems of American English pronunciation, 2) vowels, 3) consonant system (including such features as minimal pairs), 4) prosody, intonation, rhythm, and stress, and 5) regionalism and social varieties, and 6) pedagogical approaches to teaching the features of American English. (Typically offered: Fall)

CIED 5523. Instructional Practices in Teaching Foreign Language. 3 Hours.

A pedagogical studies course based on the theoretical and practical aspects of methods, techniques, and materials for effective teaching of foreign languages in K-12 schools. Prerequisite: Admission to M.A.T. Program. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

CIED 5543. Structures of American English. 3 Hours.

This course provides an introduction to the grammars of English, including (but not restricted to) traditional, structural, and transformational-generative (universal grammar). It includes approaches to the teaching of all types of grammars. (Typically offered: Spring and Summer)

CIED 5553. Social Justice and Multicultural Issues in Education. 3 Hours.

This seminar provides an introduction to the major concepts and issues related to multicultural education and social justice in education and the ways in which race, ethnicity, class, gender, and exceptionality influence students' behavior. The course also examines the intersection of teacher and student perceptions of identity, schooling, and learning and the effects on educational systems. Prerequisite: Admission to MAT. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

CIED 5563. Teaching Internship/Action Research. 3 Hours.

During this course, Master's candidates will be provided with classroom time to prepare to teach and then will be assigned to a classroom or classrooms. During this time the candidates will have an opportunity (under supervision) to observe, to teach and to participate in classroom activities. Additionally, candidates will research some area of their own pedagogy relevant to the experience. (Typically offered: Irregular)

CIED 5573. Foundations of Literacy. 3 Hours.

Teaching of reading to children; techniques, research, and modern practices. (Typically offered: Fall, Spring and Summer)

CIED 5593. Advanced Diagnosis and Intervention. 3 Hours.

Emphasizes the diagnosis and remediation of reading difficulties in the classroom setting. Students are expected to become familiar with cause of reading failure, diagnosis instruments and procedures, principles of report writing, and corrective instructional methods and materials. The course is open to graduate students with instructor's consent. Enrollment limited to 20. Prerequisite: CIED 5573. (Typically offered: Irregular)

CIED 5683. Adolescent Literature. 3 Hours.

Content course in adolescent literature including selection, reading, evaluation, and psychological basis of classic and contemporary works. (Typically offered: Fall, Spring and Summer)

CIED 5713. Integrating the Elementary Curriculum. 3 Hours.

This course focuses on meaningful integration of science, mathematics, literacy, social studies, art, and music in the elementary classroom. A strong foundation for integrating the elementary curriculum will be developed by providing students with theoretical frameworks, research, resources, and methods related to classroom practice. Strategies to coordinate the integration of these subject areas for the K-4 classroom will be modeled. (Typically offered: Summer)

CIED 5723. Nature and Needs of Persons with Mild Disabilities. 3 Hours.

Educational, psychological, and social characteristics of individuals who have mild disabilities with emphasis on educational methods and modifications. Prerequisite: CIED 3023. (Typically offered: Fall)

CIED 5803. Nature and Needs of the Gifted and Talented. 3 Hours.

Educational, psychological, and social characteristics of gifted and talented children. Prerequisite: Graduate standing. (Typically offered: Fall)

CIED 5813. Curriculum Development in Gifted and Talented. 3 Hours.

Examines the various models for developing curriculum and providing services for students identified for gifted programs. Prerequisite: CIED 5803. (Typically offered: Spring)

CIED 5823. Gifted and Talented (Structured) Practicum. 3 Hours.

Supervised field experience in gifted education programs, schools, institutions, and other facilities for gifted/talented children. Prerequisite: CIED 5813. (Typically offered: Summer)

CIED 5843. Representations of American Education in Film. 3 Hours.

This course provides an examination of students, teachers, administrators, schools, and schooling as they exist on the silver screen. Of particular interest is how film representations and misrepresentations potentially affect public perceptions of education. This course draws on educational theory and the field of cultural studies. (Typically offered: Irregular)

CIED 5853. Issues in Mathematics Education. 3 Hours.

Study of research in mathematics education and applications to classroom teaching and learning. Emphasis will be given past and current research in the areas of students' cognitive development in mathematics, mathematics curriculum development, and teaching practices and assessment. (Typically offered: Irregular)

CIED 5913. Parent/Family Engagement for Culturally & Linguistically Diverse Students. 3 Hours.

Students will investigate characteristics of family-community engagement systems and models serving culturally and linguistically diverse (CLD) students and families. Identify qualities of a welcoming, accepting environment for CLD families and implement some of these characteristics in their classroom and schools. Support communication and facilitate contributions by CLD families to the school and community including leadership roles. Demonstrate knowledge, skills, best practices and resources to enhance CLD family-community engagement by developing and implementing a service-learning project in their school or community. Prerequisite: Graduate standing. (Typically offered: Summer)

CIED 5923. Second Language Acquisition. 3 Hours.

This is one of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course gives an introduction to the basics in research and learning theories involved in the acquisition of second languages and cultures, particularly ESL. (Typically offered: Fall)

CIED 5933. Second Language Methodologies. 3 Hours.

This is one of a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course introduces the basics in approaches, methodologies, techniques, and strategies for teaching second languages, especially ESL. (Typically offered: Spring)

CIED 5943. Teaching People of Other Cultures. 3 Hours.

This is one in a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course focuses on cultural awareness, understanding cultural differences, and instruction methods for integrating second cultures, especially the culture of the United States, into the curriculum. (Typically offered: Fall)

CIED 5953. Second Language Assessment. 3 Hours.

This is one in a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course introduces basic methods for testing, assessing and evaluating second language, especially ESL, learners for placement purposes and academic performance. (Typically offered: Spring)

CIED 5973. Practicum in Secondary Education. 3 Hours.

Students will engage in action research in a school setting to advance their knowledge of teaching and learning venues including schools and informal learning environments. Prerequisite: Permission. (Typically offered: Fall and Spring)

CIED 5983. Practicum in Curriculum & Instruction. 3 Hours.

This course will provide degree candidates with advance knowledge of teaching in the elementary or secondary schools. This will be accomplished through a semester-long practicum during which an action research project will be designed, enacted, and reported. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CIED 599V. Special Topics. 1-18 Hour.

Special topics. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CIED 600V. Master's Thesis. 1-6 Hour.

This course is designed for students completing a thesis at the master's level in curriculum and instruction and related programs. It may be taken multiple times for 1-6 credits but no more than 6 credits will be counted toward the degree. Prerequisite: Graduate Standing (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CIED 6013. Curriculum Theory, Development, and Evaluation. 3 Hours.

Principles and concepts of curriculum and development, with an analysis of the factors basic to planning, the aims of the educational program, the organization of the curriculum, curriculum models, and elements desirable in the curriculum of schools including evaluation. (Typically offered: Fall Odd Years)

CIED 6023. Instructional Theory. 3 Hours.

Study of psychological, anthropological, sociological, and educational theories of instruction and learning. Emphasis is placed on synthesizing a broad range of existing and emerging perspectives in understanding individual, interactional and contextual phenomena of instruction and learning. (Typically offered: Spring Even Years)

CIED 6033. Content Specific Pedagogy. 3 Hours.

This course explores the relationship between the content of courses taught in schools and the pedagogical principles that the teaching of the content requires. Students will discuss and synthesize findings from the research literature and from personal investigation. (Typically offered: Irregular)

CIED 6043. Analysis of Teacher Education. 3 Hours.

This course examines issues, problems, trends, and research associated with teacher education programs in early childhood, elementary, special education, and secondary education. Prerequisite: CIED 6023. (Typically offered: Summer Even Years)

CIED 6053. Curriculum and Instruction: Learner Assessment and Program Evaluation. 3 Hours.

This course provides an overview of designing, implementing and analyzing learner assessments as well as systemic and program evaluations in a variety of instructional environments. (Typically offered: Spring Even Years)

CIED 6073. Seminar in Developing Creativity. 3 Hours.

A study of the facets of creativity, how they can be applied to be used in one's everyday life, how they can be applied in all classrooms, and how to encourage the development of these in students. (Typically offered: Irregular)

CIED 6083. Piaget's Theory and Instruction. 3 Hours.

Piaget's theory has been applied to classroom instruction in various settings. This course will investigate the theory in depth, study classroom application, and students will devise application. Prerequisite: CIED 6023. (Typically offered: Spring Odd Years)

CIED 6093. Vygotsky in the Classroom. 3 Hours.

This course introduces the cultural-historical theory of L. Vygotsky and considers its complexity. The comprehensive nature of Vygotsky's heritage and the importance of the sociocultural context for understanding his work is emphasized, as well as the implications of his theories for contemporary educational settings. (Typically offered: Fall Even Years)

CIED 6123. New Literacy Studies. 3 Hours.

In the past decade scholars have expressed an interest in the diverse literacy practices in which adolescents engage outside of school. In using new media, adolescents interweave multiple sign system, including word and image, to construct a narrative or communicate information. How do readers interpret these texts? What conventions do authors manipulate to influence the meanings they construct? This course aims to answer these and other questions. (Typically offered: Fall Odd Years) May be repeated for up to 12 hours of degree credit.

CIED 6133. Trends and Issues in Curriculum and Instruction. 3 Hours.

Analysis of trends and issues in curriculum and instruction with emphasis on political/social contexts and prevailing philosophies/theories/practices across disciplines. Prerequisite: Admittance in Ed.D, Ed.S. or Ph.D. program. (Typically offered: Fall Even Years)

CIED 6143. Differentiated Instruction for Academically Diverse Learners. 3 Hours.

Major focus of this course will be the examination of differentiated instruction, a teaching philosophy appropriate for a wide range of learners. (Typically offered: Summer Even Years)

CIED 6153. Theories of Literacy Learning. 3 Hours.

In this seminar, students consider theories of literacy learning and their implications for practice and research. Theories are viewed as historically and socially situated, and students reflect on how their own work might be situated within these theories. The ways in which theories support research methodology are also explored. (Typically offered: Spring Odd Years)

CIED 6163. Social and Emotional Components of Gifted and Talented Students. 3 Hours.

Purpose of this course is to study the theoretical and practical aspects of those affective issues, behaviors, and experiences often associated with gifted and talented students. (Typically offered: Summer Even Years)

CIED 6173. Reviews of Research in Reading Comprehension. 3 Hours.

In this online course, students will learn types of reviews of research, including qualitative systematic reviews and meta-analyses, and will conduct a review of research on a topic related to reading comprehension. Students will consider implicit and explicit definitions of comprehension and the influence various definitions have on assessment, instruction, policy and research and will examine comprehension in different contexts, disciplines, genres, and platforms. The course is a CIED Area of Study or Cognate Course (not part of the Inquiry Core). (Typically offered: Summer Even Years)

CIED 6183. Theory and Research in Arts Integration. 3 Hours.

Content course in arts integration including the pedagogy, design, and implementation of lesson plans which simultaneously address core curriculum learning targets and teach skills through the visual and performing arts in order to address the needs of the learners of the new millennium. Prerequisite: Instructor consent. (Typically offered: Spring and Summer)

CIED 6193. Teaching English Language Learners in the Content Areas. 3 Hours.

This course prepares teachers to teach English language learners in math, science, and social studies. These subject areas each have their own vocabulary that must be mastered by English language learners. The course focuses on teachers of both children and adults. (Typically offered: Spring)

CIED 6243. Bakhtin in Language, Literacy, and Research. 3 Hours.

This seminar course explores a growing body of theory, research, and applications inspired by the ideas of Russian scholar Mikhail M. Bakhtin, who provides a unique perspective on language, literacy, and culture. Bakhtin's focus on the process of meaning-making through dialogic interaction is relevant for educators in all academic areas. Bakhtin's ideas provide a powerful humanistic alternative to prevailing formalistic tendencies in studying language, culture, and education. Many modern orientations, such as discourse analysis and dialogic pedagogy, can be traced to Bakhtinian concepts. In addition to exploring Bakhtinian concepts in language and literacy, this course applies a Bakhtinian framework for research. (Typically offered: Fall Odd Years)

CIED 6313. Issues, History, and Rationale of Science Education. 3 Hours.

This course is the foundation experience for those interested in the discipline of science education. It provides an overview of the fundamental issues in and vocabulary of science education. The course includes the research basis for science teaching, the literature of science education, and the issues and controversies surrounding the teaching of science. (Typically offered: Irregular)

CIED 6333. Nature of Science: Philosophy of Science for Science Educators. 3 Hours.

The Nature of Science is a hybrid arena consisting of aspects of the philosophy, history and sociology of science along with elements of the psychology of scientific observations all targeting the complete understanding of how science actually functions. Prerequisite: Admission to grad school. (Typically offered: Irregular)

CIED 6343. Advanced Science Teaching Methods. 3 Hours.

This course is designed for those educators who have had some previous instruction in science teaching methods and/or had some prior science teaching experience. Students will gain new or renewed perspectives with respect to their personal teaching ability while engaging in discussions and activities designed to assist others in professional grow in science instruction. Prerequisite: Admission to graduate school. (Typically offered: Irregular)

CIED 6443. Mixed Methods Research. 3 Hours.

This course will provide opportunities for students to acquire the skills, knowledge, and strategies necessary to design and implement a mixed methods research study. Emphasis is upon developing research questions, developing a research design, selecting a sample, and utilizing appropriate techniques for analyzing data. (Typically offered: Fall)

CIED 6533. Problem-Based Learning and Teaching. 3 Hours.

A course in the design, development, and delivery of the problem-based learning (PBL) model. Theoretical cases and curriculum models will be centered on issues and models related to PBL. (Typically offered: Irregular)

CIED 6603. Multicultural Education. 3 Hours.

This course is designed to trace, examine, discuss, and promote understanding of issues related to multicultural education, different views of multicultural education, and the impact of multicultural education upon the schooling process. Emphasis is upon schooling experiences of culturally diverse students, language issues, gender issues, and evaluation issues. Prerequisite: Admission to the Ed.S. or Ph.D. program. (Typically offered: Spring)

CIED 6623. Research Methods and Scholarship in Curriculum and Instruction. 3 Hours.

In this course students will look at methods and practices in writing a successful dissertation proposal. Emphasis will be placed on research studies, collection of reliable and valid data, and analysis of data. Throughout the course, topics will focus on what scholarship looks like in curriculum and instruction. Prerequisite: Advanced standing in the doctoral program. (Typically offered: Fall)

CIED 674V. PhD Research Internship. 1-6 Hour.

This research internship is for doctoral level students in curriculum and instruction. The goal is provide research experience within the doctoral course of study. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 680V. Ed.S. Project. 1-6 Hour.

Instructor permission required to register. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

CIED 684V. PhD Teaching Internship. 1-6 Hour.

This teaching internship is for doctoral level students in curriculum and instruction. The goal is to provide teaching experience within the doctoral course of study. (Typically offered: Fall, Spring and Summer)

CIED 694V. Special Topics. 1-6 Hour.

Discussion and advanced studies on selected topics in curriculum and instruction. Specific focus on recent developments. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CIED 695V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer)

CIED 699V. Doctoral Seminar. 1-3 Hour.

Doctoral seminar. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

CIED 700V. Dissertation. 1-18 Hour.

Dissertation. Prerequisite: Candidacy (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Special Education Courses

SPED 4413H. Honors ABA and Classroom Management for Teachers. 3 Hours.

Students in this course will develop an understanding of the basic principles of Applied Behavior Analysis (ABA) and learn how to implement these principles across a Positive Behavior Support Model. Intervention plans include development of individual supports, classroom management supports, and whole school behavior supports. Field experience required. Prerequisite: Honors standing. (Typically offered: Fall)

This course is equivalent to SPED 4413.

SPED 5143. Teaching Communication Skills to Persons with Autism. 3 Hours.

This course focuses on classroom and teaching strategies for the development of communication skills with students who have autism spectrum disorders. Students will learn the characteristics of typical language development, atypical language development in autism, functional communication training and behavior analytic approaches to teaching communication. Prerequisite: Admission to the Graduate School. (Typically offered: Summer)

SPED 5173. Introduction to Dyslexia: Literacy Development & Structure of Language. 3 Hours.

This course focuses on the assessment of students with disabilities, literacy development, skills and intervention. Students will utilize foundational concepts of oral and written language including the structure of language to assess students' difficulties and plan appropriate instruction. Techniques discussed include informal observation, miscue analysis, multisensory teaching, and portfolio assessment. Prerequisite: Admission to graduate school. (Typically offered: Spring)

SPED 532V. Practicum in Special Education. 1-6 Hour.

Supervised field experiences in special education programs, schools, institutions, and other facilities for exceptional children. (Typically offered: Irregular)

SPED 5343. Analysis of Behavior for Teachers. 3 Hours.

An advanced course in managing behaviors in students with exceptionalities. Students are provided with experiences in applying theoretical bases of classroom management through identifying, assessing graphing, and analyzing behavioral data and implementing management plans. Ethical issues in the use of functional analysis are addressed. (Typically offered: Fall)

SPED 5413. ABA and Classroom Management for Teachers. 3 Hours.

(Formerly SPED 4413.) Students in this course will develop an understanding of the basic principles of Applied Behavior Analysis (ABA) and learn how to implement these principles across a Positive Behavior Support Model. Intervention plans include development of individual supports, classroom management supports, and whole school behavior supports. Graduate degree credit will not be given for both SPED 4413 and SPED 5413. (Typically offered: Fall)

SPED 5423. Technology for the Inclusive Classroom. 3 Hours.

(Formerly SPED 4423.) A study of the use of instructional and assistive/augmentative technology for students with learning differences and special learning needs. Graduate degree credit will not be given for both SPED 4423 and SPED 5423. (Typically offered: Fall)

SPED 5433. Curriculum Development and Instructional Planning. 3 Hours.

(Formerly SPED 4433.) Study of the research base for the design and adaptation of curriculum and instructional strategies for students with disabilities in general and special classrooms. Graduate degree credit will not be given for both SPED 4433 and SPED 5433. (Typically offered: Fall)

SPED 5443. Career Development and Transition Planning for Students with Disabilities. 3 Hours.

(Formerly SPED 4443.) A study of career development theory and the research-based strategies for evaluating, planning, and implementing transition programs for students with disabilities. Graduate degree credit will not be given for both SPED 4443 and SPED 5443. (Typically offered: Fall)

SPED 5463. Teaching Students with Significant Disabilities. 3 Hours.

(Formerly SPED 4463.) A study of methods and materials for teaching students (K-12) with severe disabilities, including severe mental retardation, serious emotional disturbance, other health impairments, multiple disabilities, and severe physical disabilities. Graduate degree credit will not be given for both SPED 4463 and SPED 5463. (Typically offered: Spring)

SPED 5483. Teaching Literacy Skills to Students with Disabilities. 3 Hours.

(Formerly SPED 4483.) This course will offer a detailed study of how to systematically and explicitly teach essential reading skills to students with disabilities or those at-risk for learning difficulties. Graduate degree credit will not be given for both SPED 4483 and SPED 5483. (Typically offered: Spring)

SPED 5493. Introduction to Students with Autism Spectrum Disorder. 3 Hours.

(Formerly SPED 4493.) The purpose of this course is to develop an understanding of autism spectrum disorders, understand the unique characteristics as they apply to the context of the classroom, be able to design an appropriate classroom setting, and use evidence based teaching practices for students with autism spectrum disorders. Graduate degree credit will not be given for both SPED 4493 and SPED 5493. (Typically offered: Spring)

SPED 5543. Dyslexia Teaching Practicum. 3 Hours.

Provides the opportunity to demonstrate and refine teaching skills with dyslexic students and others with literacy learning disabilities through case studies and structured multi-sensory teaching of reading and writing skills with grades k-12 while simultaneously developing a professional portfolio. A minimum of 82 hours of field experiences with dyslexic students is required. (Typically offered: Spring)

SPED 5633. Curriculum Development and Instructional Planning. 3 Hours.

Study of the research base for the design and adaptation of curriculum and instructional strategies for students with disabilities in general and special classrooms. (Typically offered: Irregular)

SPED 5643. Individual Diagnostic Testing. 3 Hours.

A study of various individual diagnostic tests used to identify students with disabilities and develop individual educational programs. Prerequisite: Admission to Graduate School. (Typically offered: Irregular)

SPED 5653. Individual Intelligence Testing. 3 Hours.

A study of various individual intelligence tests, including the Wechsler series, and their use in schools to identify students with disabilities. Prerequisite: Admission to Graduate School. (Typically offered: Irregular)

SPED 5663. Teaching Science and Math to Students with Disabilities. 3 Hours.

A study of content, methods, and materials for teaching science and math courses to students with diverse learning needs and how to adapt curriculum to meet diverse needs. Prerequisite: Admission to graduate school. (Typically offered: Irregular)

SPED 5673. Teaching Students with Disabilities in the Content Areas. 3 Hours.

A study of content, methods, and materials for teaching content courses to students with diverse learning needs (K-12). (Typically offered: Irregular)

SPED 5683. Teaching Literacy Skills to Students with Disabilities. 3 Hours.

This course will offer a detailed study of how to systematically and explicitly teach essential reading skills to students with disabilities or those at-risk for learning difficulties. (Typically offered: Irregular)

SPED 5713. Career Development and Transition for People with Disabilities. 3 Hours.

This is an advanced course at the master's level in the specialty studies. The Scholar Practitioner model at this level will pursue an in-depth study of the transition process for students with disabilities including transition plan development, work based learning opportunities, developing skills in self-advocacy and self-determination using evidence based practices, family engagement, collaborative program planning and evaluation. (Typically offered: Fall)

SPED 5733. Inclusive Practices for Diverse Populations. 3 Hours.

An advanced study of the characteristics of persons with exceptional learning needs and the provision of appropriate instruction in the general education classroom including the use of current technologies including instructional media, social networking, and other educational technologies. Prerequisite: Graduate standing. (Typically offered: Summer)

SPED 5743. Teaching Persons With Physical and Health Disabilities. 3 Hours.

This course is an advanced course at the master's level in the specialty studies. The Scholar Practitioner model at this level will pursue an in-depth study of the characteristics, needs, and methods for teaching of persons with physical and health disabilities while emphasizing advance learning in the specialty studies and the social and behavioral studies in the substantive areas. Prerequisite: Graduate standing. (Typically offered: Spring)

SPED 5753. Nature and Needs of Persons with Serious Emotional Disorders. 3 Hours.

A survey of the educational, psychological, and social characteristics of individuals with serious emotional disorders. Four major categories of behaviors (personality disorders, pervasive developmental disorders, and learning/behavior disorders) are reviewed in relationship to identification, assessment, and program intervention within the public school setting. Prerequisite: CIED 3023. (Typically offered: Irregular)

SPED 5763. Teaching Individuals with Severe Disabilities. 3 Hours.

Methods and materials for teaching students with severe disabilities, including severe mental retardation, serious emotional disturbance, and severe physical disabilities. (Typically offered: Spring)

SPED 5773. Methods for Young Children with Disabilities. 3 Hours.

This course is one of the substantive core courses required of all students being recommended for the P-4 Instructional Specialist license. The Scholar-Practitioner Model at this level provides an introduction to the education of young children with special learning needs and a foundation for the developing professional. (Typically offered: Irregular)

SPED 5783. Professional and Family Partnerships. 3 Hours.

This course is an advanced course at the master's level in the specialty studies. The Scholar Practitioner model at this level will pursue an in-depth study of family-school partnerships from early childhood through the transition to adulthood while emphasizing advance learning in the specialty studies and the social and behavioral studies in the substantive areas. Prerequisite: Admission to graduate school. (Typically offered: Fall)

SPED 5793. Practicum in Applied Behavior Analysis. 3 Hours.

This course is a supervised practicum that provides students with experience in applying the knowledge, skills, and dispositions by teaching individuals using Applied Behavior Analysis. Instructor approval needed for enrolling in the course. Prerequisite: Instructor Consent. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

SPED 5873. Assessment and Programming for Students with Disabilities. 3 Hours.

Methods and techniques of assessment of children in all areas of exceptionality with emphasis on diagnosis and classification. (Typically offered: Fall)

SPED 5883. Research in Inclusive Education. 3 Hours.

Review of research in inclusive education including all areas of exceptionality and English language learners with emphasis on research-based practices. (Typically offered: Fall)

SPED 5893. Organization, Administration and Supervision of Special Education. 3 Hours.

Procedures, responsibilities and problems of organization, administration, and supervision of special education programs. (Typically offered: Irregular)

SPED 599V. Special Topics. 1-6 Hour.

Discussion and readings on selected topics in special education. Special focus on recent and emerging topics in special education. Prerequisite: Admission to Graduate School and Special Education graduate program. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SPED 605V. Independent Study. 1-6 Hour.

Advanced studies on potential research topics for graduate students in special education. Prerequisite: Admission to the Graduate School and instructor consent. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SPED 6403. Emerging Issues in Special Education. 3 Hours.

A study in the complex issues with which professionals in the field of special education must be familiar and prepared to address. (Typically offered: Irregular)

SPED 641V. Special Topics in Special Education. 1-3 Hour.

Discussion and advanced studies on select topics in special education. Specific focus will include evidence-based and emerging practices in special education. (Typically offered: Irregular)

SPED 6423. Philosophical and Sociological Bases of Special Education. 3 Hours.

A study of the basic philosophical and sociological bases for current practices in special education. (Typically offered: Irregular)

SPED 6433. Legal Aspects of Special Education. 3 Hours.

A study of litigation and legislation in special education, federal and state laws and court cases, and due process hearings. (Typically offered: Irregular)
This course is cross-listed with EDLE 6433.

SPED 6453. Human Performance Improvement. 3 Hours.

This course is an introduction to Human Performance Technology, a rapidly growing field that applies the principles, methods, and empirical generalizations of Behavior Analysis to improving human performance in organizations. Working from a theoretical basis, students will learn how to diagnose performance discrepancies in organizational settings, design and evaluate appropriate behavior-based solutions. Prerequisite: SPED 6843. (Typically offered: Spring)

SPED 6463. Concepts and Principles in Behavior Analysis. 3 Hours.

Course provides information on: (a) the philosophical assumptions and principles of behavior analysis; (b) basic principles, processes, and concepts of applied behavior analysis; and (c) the ethical and legal issues in its use. Prerequisite: SPED 6843. (Typically offered: Summer)

SPED 6803. Teaching Students with Autism Spectrum Disorders. 3 Hours.

This course provide students with an understanding of individuals who have been diagnosed with autism spectrum disorders. The course provides a life-span perspective by focusing on preschoolers, school-aged children, and adults. Students will study the characteristics of these individuals and general educational strategies for their education. (Typically offered: Fall)

SPED 6813. Characteristics and Assessment of Persons with ASD. 3 Hours.

This course provides an in-depth study of the characteristics and assessment of persons with autism spectrum disorders. It includes formal and informal assessment measures used to assist in the identification of students with ASD, as well as provide information for program development for this group of students. (Typically offered: Spring)

SPED 6823. Instructional Methods for Students with Autism Spectrum Disorders. 3 Hours.

This course is designed to assist professional educators in planning and implementing instructional and support services for students with autism spectrum disorders. Students will learn how to participate in collaborative family, school, and community partnerships. (Typically offered: Fall)

SPED 6833. Practicum in Autism Spectrum Disorders. 3 Hours.

Supervised field experiences in programs, schools, and other settings for children with autism spectrum disorders. (Typically offered: Fall, Spring and Summer)

SPED 6843. Basic Principles of ABA. 3 Hours.

Course provides information on: (a) the philosophical assumptions and principles of behavior analysis; (b) basic principles, processes, and concepts of applied behavior analysis; and (c) ethical and legal issues involved in its use. Prerequisite: Admittance to the Applied Behavior Analysis Graduate Certificate (APBAGC). (Typically offered: Fall)

SPED 6853. Behavioral Assessment in ABA. 3 Hours.

Course content includes information on effective methods and the development of skills: (a) assessing, organizing, and interpreting behavior; (b) conducting task analysis and selecting intervention goals and strategies; (c) displaying data; and (d) making evidence-based decisions. Legal and ethical standards will be reviewed and applied to behavioral change procedures used. Prerequisite: SPED 6843. (Typically offered: Summer)

SPED 6863. Behavior Change Procedures and Supports. 3 Hours.

Course content includes (a) information on behavior change procedures; (b) activities designed to acquire skill in developing and evaluating behavioral change programs; and (c) information and activities designed to acquire skills in providing and monitoring persons and systems providing support. Legal and ethical standards will be reviewed and applied to the course content. Prerequisite: SPED 6843. (Typically offered: Spring)

SPED 6873. Measurement and Experimental Design. 3 Hours.

Course content includes information on and the development of skills in: (a) the measurement of the multiple dimensions of behaviors; (b) the use of methods of measuring behavior; (c) the experimental evaluation of interventions; and (d) the multiple methods of displaying and interpreting behavioral data. Legal and ethical standards will be reviewed and applied to the course content. (Typically offered: Fall)

SPED 6883. ABA Ethical, Professional, and Legal Standards. 3 Hours.

Course content includes information on the ethical, professional and legal standards in special education and, specifically, the area of applied behavior analysis. Prerequisite: SPED 6843. (Typically offered: Summer)

Statistics and Analytics (STAN)

Mark Arnold
Program Director
301 Science Engineering Building
479-575-3351
Email: arnold@uark.edu

Degree Conferred:
M.S. (STANMS)

Graduate Certificate Offered:
Graduate Certificate in Statistics and Analytics (STANGC) (Nondegree)

Program Description: The Graduate Certificate and M.S. degree in Statistics and Analytics are cross-college interdisciplinary programs that build on the university's current strengths in the Colleges of Arts and Sciences; Business; Education and Health Professions; and Engineering.

Students may choose one of six concentrations: Statistics; Biological Analytics; Business Analytics; Operations Analytics; Computational Analytics; Educational Statistics & Psychometrics; or Quantitative Social Sciences.

Primary Areas of Faculty Research: Statistics and statistical analysis and design methodologies in business analytics, operations analytics, computational analytics, educational statistics and social science research.

Admission to the Master's Program: In addition to the requirements of the Graduate School, applicants for admission to the M.S. program in Statistics and Analytics must submit a) three letters of recommendation from persons familiar with the applicant's previous academic and professional performance and b) official test scores as specified for the applicant's area of interest.

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Concentration in Biological Analytics

Undergraduate Deficiencies

MATH 2554 Calculus I (ACTS Equivalency = MATH 2405)

MATH 3083 Linear Algebra

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design 12

Required Courses

CSCE 5013 Advanced Special Topics in Computer Science or Computer Engineering (taken as introduction to cluster computing) 3

BIOL 5153 Practical Programming for Biologists 3

ISYS 5723 Advanced Multivariate Analysis 3

Choose from one of the following options: 9

9 additional hours of electives

3 hours of electives, 6 hours of thesis credit, and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours 30

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Concentration in Business Analytics

Undergraduate Deficiencies

MATH 2554 Calculus I (ACTS Equivalency = MATH 2405)

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design 12

Required Courses

ISYS 511V IT Toolkit & Skills Seminar 3

ISYS 5833 Data Management Systems 3

ISYS 5843 Seminar in Business Intelligence and Knowledge Management 3

Choose one of the following options: 9

9 hours of electives

3 hours of electives and 6 hours of thesis credit and submission of an acceptable thesis.

Written comprehensive exam (non-thesis) or defense of the thesis.

Total Hours 30

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for a Concentration in Computational Analytics

Undergraduate Deficiencies

MATH 2554 Calculus I (ACTS Equivalency = MATH 2405)

MATH 3083 Linear Algebra

CSCE 4133 Algorithms

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design. 12

Required Courses

CSCE 4523 Database Management Systems 3

Two of the following: 6

CSCE 4613 Artificial Intelligence

Choose one of the following options: 9

9 hours of electives

3 hours of electives, 6 hours of thesis credit and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

CSCE 5063 Machine Learning

CSCE 5073 Data Mining

Total Hours 30

Requirements for a Concentration in Computational Analytics

Undergraduate Deficiencies

MATH 2554 Calculus I (ACTS Equivalency = MATH 2405)

MATH 3083 Linear Algebra

CSCE 4133	Algorithms	
Core		
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design.		12
Required Courses		
CSCE 4523	Database Management Systems	3
Two of the following:		6
CSCE 4613	Artificial Intelligence	
Choose one of the following options:		9
9 hours of electives		
3 hours of electives, 6 hours of thesis credit and submission of an acceptable thesis		
Written comprehensive exam (non-thesis) or defense of the thesis		
CSCE 5063	Machine Learning	
CSCE 5073	Data Mining	
Total Hours		30

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Concentration in Educational Statistics and Psychometrics

Undergraduate Deficiencies

MATH 2554	Calculus I (ACTS Equivalency = MATH 2405)
MATH 3083	Linear Algebra

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

Required Courses

ESRM 5653	Educational Assessment	3
ESRM 6653	Measurement and Evaluation	3
ESRM 6753	Item Response Theory	3
ESRM 699V	Seminar (as approved by the student's advisory committee)	3

Choose one of the following options: 9

9 hours of electives as approved by the student's advisory committee	
3 hours of electives, 6 hours of thesis credit, and submission of an acceptable thesis	

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours 33

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Concentration in Operations Analytics

Undergraduate Deficiencies

MATH 2554	Calculus I (ACTS Equivalency = MATH 2405)
MATH 3083	Linear Algebra
STAT 3013	Introduction to Probability

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

Required Courses

INEG 5613	Introduction to Optimization Theory	3
INEG 5803	Simulation	3

One of the following: 3

ISYS 5843	Seminar in Business Intelligence and Knowledge Management
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CSCE 5073	Data Mining
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Choose one of the following options: 9

9 hours of electives	
3 hours of electives, 6 hours of thesis credit and submission of an acceptable thesis	

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours 30

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for a Concentration in Quantitative Social Science

Undergraduate Deficiencies

MATH 2554	Calculus I (ACTS Equivalency = MATH 2405)
MATH 3083	Linear Algebra
STAT 3013	Introduction to Probability

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design.

Required Courses

ISYS 5723	Advanced Multivariate Analysis	3
ECON 4753	Forecasting	3
ECON 6623	Econometrics II	3
ECON 6633	Econometrics III	3

Choose one of the following options: 6

6 hours of electives to include two of the following: cost benefit analysis; GIS and spatial analysis; multilevel modeling; social network analysis

6 hours of thesis credit and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours 30

Requirements for the Master of Science (M.S.) Degree

Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for Concentration in Statistics

Undergraduate Deficiencies

MATH 2564	Calculus II (ACTS Equivalency = MATH 2505)
MATH 3083	Linear Algebra
CSCE 2014	Programming Foundations II

Core

Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design 12

Required Courses

STAT 5103	Introduction to Probability Theory	3
STAT 5113	Statistical Inference	3
STAT 5333	Analysis of Categorical Responses	3
STAT 639V	Topics in Statistics	3
Choose one of the following options:		6
6 hours of electives		
6 hours of thesis credit and submission of acceptable thesis		
Written comprehensive exam (non-thesis) or defense of thesis		
Total Hours		30

Graduate Certificate in Statistics and Analytics (STAN)

Requirements for the Graduate Certificate in Statistics and Analytics:

The Graduate Certificate requires 12 hours of courses as specified below.

Choose one of the following:		3-4
STAT 5003	Statistical Methods & STAT 5001L and Statistics Methods Laboratory	
ESRM 6403	Educational Statistics and Data Processing	
ISYS 5503	Decision Support and Analytics	
PLSC 5913	Research Methods in Political Science	
PSYC 5133	Inferential Statistics for Psychology	
SOCI 5013	Advanced Social Research	
Choose one of the following:		3
STAT 5313	Regression Analysis	
INEG 5393	Applied Regression Analysis for Engineers	
PLSC 5943	Advanced Research Methods in Political Science	
PSYC 5143	Advanced Descriptive Statistics for Psychology	
SOCI 5313	Applied Data Analysis	
Choose one of the following:		3
STAT 5353	Methods of Multivariate Analysis	
ISYS 5723	Advanced Multivariate Analysis	
ESRM 6453	Applied Multivariate Statistics	
Choose one of the following:		3
STAT 4373	Experimental Design	
INEG 5333	Design of Industrial Experiments	

ESRM 6413 Experimental Design in Education

Total Hours 12

Graduate Faculty

Aloysius, John, Ph.D. (Temple University), B.S. (University of Colombo, Sri Lanka), Professor, Department of Supply Chain Management, 1995.

Beaulieu, Jeremy M., Ph.D. (Yale University), M.S., B.S. (California Polytechnic State University), Assistant Professor, Department of Biological Sciences, 2016.

Bridges, Ana Julia, Ph.D. (University of Rhode Island), M.S. (Illinois State University), B.S. (University of Illinois-Urbana-Champaign), Professor, Department of Psychological Science, 2007.

Cao, Chunhua, Ph.D. (University of South Florida-Tampa), Teaching Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2019.

Cassady, Richard, Ph.D., M.S.I.S.E., B.S.I.S.E. (Virginia Polytechnic Institute and State University), University Professor, Department of Industrial Engineering, 2000.

Chakraborty, Avishek, Ph.D (Duke University), M.S., B.S. (Indian Statistical Institute), Assistant Professor, Department of Mathematical Sciences, 2014.

Chimka, Justin Robert, Ph.D., M.S.I.E., B.S.I.E. (University of Pittsburgh), Associate Professor, Department of Industrial Engineering, 2002.

Datta, Jyotishka, Ph.D. (Purdue University), M.Stat., B.Stat. (Indian Statistical Institute, Kolkata, India), Assistant Professor, Department of Mathematical Sciences, 2016.

Ferrier, Gary D., Ph.D. (University of North Carolina-Chapel Hill), B.A. (University of Wisconsin-Madison), University Professor, Department of Economics, 1993.

Freeze, Ron, Ph.D. (Arizona State University), M.B.A. (University of Missouri-Kansas City), B.S. (General Motors Institute), Clinical Associate Professor, Department of Information Systems, 2015.

Gaduh, Arya, Ph.D. (University of Southern California), M.Phil. (Cambridge University), B.A. (University of California-Berkeley), Associate Professor, Department of Economics, 2013.

Gauch, Susan E., Ph.D. (University of North Carolina at Chapel Hill), M.Sc., B.Sc. (Queen's University, Canada), Professor, Department of Computer Science and Computer Engineering, 2007.

Gbur, Edward E., Ph.D., M.S. (The Ohio State University), B.S. (Saint Francis University), Professor, Department of Crop, Soil and Environmental Sciences, 1987.

Gu, Jingping, Ph.D. (Texas A&M University), M.A. (Peking University), B.A. (Renmin University of China, Beijing), Associate Professor, Department of Economics, 2008.

Mauromoustakos, Andy, Ph.D., M.S. (Oklahoma State University), B.S. (Oral Roberts University), Professor, Department of Crop, Soil and Environmental Sciences, 1989.

Wu, Xintao, Ph.D. (George Mason University), M.E. (Chinese Academy of Space Technology), B.S. (University of Science and Technology of China), Professor, Department of Computer Science and Computer Engineering, 2014.

Teacher Education (EDUC)

Ed Bengtson
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Laura Kent

Program Director
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Department of Curriculum and Instruction Website (<https://cied.uark.edu/>)

Degrees Conferred:

M.A.T. in Teacher Education (EDUC)

See Curriculum and Instruction (p. 98) for full departmental faculty listing.

The Master of Arts in Teaching program in Teacher Education prepares students for teaching math, science, social studies at the multi-level licensure level, and foreign languages, speech and drama at the secondary level. The program offers two concentrations:

- Multiple Level Education
- Secondary Education

Students in the program learn and practice pedagogy appropriate to the concentration.

Requirements for M.A.T. in Teacher Education

Students seeking admission to the Master of Arts in Teaching in Teacher Education Program at the University of Arkansas must be aware of the deadlines and admissions policies. Once all admission requirements are met by each candidate, a committee will review all applications and notify accepted and denied candidates by April 1. Each of the five content areas (English and Speech/Drama, foreign languages, mathematics, science and social studies) has a maximum number of 12 students admitted each year and up to 60 students in the overall program. If spaces remain in a particular content area and the overall program capacity has not yet been met by April 1, admissions for that area will be considered on a rolling basis until the beginning of the first summer session. These deadlines and limitations are designed to ensure that all students have a high quality experience and reflect current need for teachers in any particular content area.

Admission to the Master of Arts in Teaching in Teacher Education requires the following steps:

Step One: Pre-MAT Requirements

- Undergraduate Courses: CIED 4131, CIED 4023 or CIED 3023, and any other content specific courses required for licensure by the Arkansas Department of Education
- Completion of appropriate undergraduate degree program
- Transcript Evaluation by content area professor
- Admission to the Office of Teacher Education

Complete the application for teacher education through the Teacher Education Office by October 1 (see the [Teacher Education Application Fee](https://forms.coehp.uark.edu/start/?form=teaching) (<https://forms.coehp.uark.edu/start/?form=teaching>)). This includes passing scores on the Math, Reading and Writing sections of the Praxis Core Academic Skills for Educators, or the equivalent scores on the ACT, SAT or GRE as defined by the Arkansas Department of Education and successful completion of the Arkansas Department of Education background checks.

Step Two: Application to Graduate School

- File an application for admission to the Graduate School by December 30.
- Hold a minimum GPA of 3.0 in the last 60 hours of the completed undergraduate degree.
- Provide three letters of recommendation before the admission interview to the Graduate School.
- Provide scores on the Praxis II Content Area test for admission to the program; foreign language students must also provide scores for the Oral Proficiency Interview (OPI).

Step Three: Application to Education MAT

- Schedule and complete an admission screening interview in February.
- Submit a portfolio at the interview.

At the time of the interview, candidates must have a GPA of 3.0 on the last 60 hours of undergraduate coursework, have passed the PRAXIS CORE exam or provide equivalent scores, submitted three letters of reference, taken the Praxis II Content Area test and the OPI for foreign language students, and submitted a portfolio.

Once the program has received all application materials from the Graduate School, an admission decision will be made based on the criteria described in the admissions policy statement. The probationary status will include the content specific courses of the spring semester term. The number admitted into specific teaching fields will be determined by both availability of internship spaces in the public schools with Cohort Partnership agreements and job market potential. However, meeting or exceeding minimum requirements does not guarantee acceptance into the M.A.T.

At the completion of the first 9 hours of MAT courses (which are taken in the summer semester), the education faculty will review the status of all the students in the program. Students with unsatisfactory performance (grade C or lower) in the summer courses will not be allowed to continue with the remainder of the program.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Requirements for the Master of Arts in Teaching Degree in Teacher Education: (Minimum 33-34 hours.)

1. Computer competencies will be demonstrated by the candidate in the admission interview portfolio or by taking an approved course.
2. CIED 4131 Practicum for Secondary and Multilevel Tracks in Education . Candidates for the M.A.T. Teacher Education program will register for this course. The requirement for this course is 60 hours of experience with children in grades K through 12. A minimum of 30 of these hours will be in a secondary school with the remaining hours in elementary or middle schools or other youth settings. These hours must be documented by the appropriate organization.
3. Students will take CIED 3023 Survey of Exceptionalities or CIED 4023 Teaching in Inclusive Secondary Settings. CIED 4023 is the preferred course.
4. Students in French, German, and Spanish will take CIED 4013 Capstone Course for Foreign Language Licensure. Students will compile a portfolio in the target language with several pieces of evidence from their content classes. In addition, students must obtain a minimum passing score of Intermediate High on the Oral Proficiency Interview prior to admission into the fall field experience.

Requirements for the Multiple Level Education Concentration:

Summer Courses

CIED 5223	Learning Theory	3
CIED 5333	Curriculum Theory and Development for Educators	3
CIED 5553	Social Justice and Multicultural Issues in Education	3

Intersession

CIED 5022	Classroom Management Concepts	2
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Fall Courses

Pedagogy

CIED 5063	Disciplinary and Interdisciplinary Literacies in Education	3
CIED 5263	Assessment, Evaluation, and Practitioner Research	3
CIED 5953	Second Language Assessment	3

Methods I

Choose one for content area specialty:		3
CIED 5213	Issues and Trends in Literacy	
CIED 5443	Methods of Teaching Foreign Language K-12	

Field Experience

CIED 528V	Teaching Experience	3
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Spring Courses

Research

CIED 5461	Capstone Research Seminar	1
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Methods II

Choose one for content area specialty:		3
CIED 5203	English Language Arts/Speech & Drama Methods of Instruction	
CIED 5523	Instructional Practices in Teaching Foreign Language	

Field Experience

CIED 528V	Teaching Experience	3
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Total Hours		33
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Requirements for the Secondary Education Concentration:

Summer Courses

CIED 5223	Learning Theory	3
CIED 5333	Curriculum Theory and Development for Educators	3
CIED 5553	Social Justice and Multicultural Issues in Education	3

Intersession

CIED 5022	Classroom Management Concepts	2
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Fall Courses

Pedagogy

CIED 5063	Disciplinary and Interdisciplinary Literacies in Education	3
CIED 5263	Assessment, Evaluation, and Practitioner Research	3
CIED 5953	Second Language Assessment	3

Methods I

Choose one for content area specialty:		3
CIED 5203	English Language Arts/Speech & Drama Methods of Instruction	

SEED 5003	Introduction to Teaching Secondary Science
SEED 5103	Methods of Teaching Secondary Social Studies I
SEED 5303	Teaching Secondary Mathematics

Field Experience

CIED 528V	Teaching Experience	3
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Spring Courses

Research

CIED 5461	Capstone Research Seminar	1
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Methods II

CIED 5213	Issues and Trends in Literacy	
SEED 5013	Teaching Secondary Science: Theory to Practice	
SEED 5113	Teaching History, Government and Economics	
SEED 5313	Theories of Learning Mathematics	

Field Experience

CIED 528V	Teaching Experience	3
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Total Hours		33
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Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Teaching English to Speakers of Other Languages (TESL)

Ed Bengtson
Chair, Department of Curriculum and Instruction
206 Peabody Hall
479-575-5111
Email: egbengts@uark.edu

Janet Penner-Williams
Program Coordinator
107 Peabody Hall
Email: jpenner@uark.edu

Degree Offered:

M.Ed. in Teaching English to Speakers of Other Languages (TESL)

Description: The program is designed to prepare teachers in the U.S. and abroad to teach English to learners whose first language is not English; graduates are also prepared to create and implement curriculum and appropriate assessments for English as a second language (ESL). It also prepares individuals for further graduate study (Education Specialist or Ph.D.). Included in the course work for the M.Ed. are the four courses required by the Arkansas Department of Education for endorsement in ESL.

M.Ed. in Teaching English to Speakers of Other Languages

Admission Requirements:

1. Students must be officially accepted by the Graduate School and accepted into the M.Ed. TESOL degree program. Once information is reviewed, the Graduate School will submit applicant's completed packet to the program for review.
2. Students must complete an appropriate undergraduate degree with a minimum 3.0 grade-point average (or equivalent for international students) on the last 60 hours of the course work for the undergraduate degree. Applicants with a minimum GPA of 3.0 on

the last 60 hours of undergraduate coursework are exempt from the standardized test requirement.

- Students with a 2.7-2.9 on the last 60 hours of undergraduate course work may be considered if an acceptable score on the Graduate Record Examination or Miller Analogies Test is obtained and letters of recommendation are submitted.

Degree Requirements:

- All students must complete 33 hours of course work

CIED 5923	Second Language Acquisition	3
CIED 5933	Second Language Methodologies	3
CIED 5943	Teaching People of Other Cultures	3
CIED 5953	Second Language Assessment	3
CIED 5393	Introduction to Linguistics	3
CIED 5543	Structures of American English	3
CIED 5313	Principles of Qualitative Research in Curriculum & Instruction	3
SPED 5883	Research in Inclusive Education	3
CIED 5913	Parent/Family Engagement for Culturally & Linguistically Diverse Students	3
CIED 6193	Teaching English Language Learners in the Content Areas	3
CIED 600V	Master's Thesis	3
Total Hours		33

Students who do not wish to complete a thesis may choose one elective to complete the 33 credit hour course of study.

Research Requirements: Students are required to take two research courses (CIED 5313 and SPED 5883). Students wishing not to complete a thesis are required to take a comprehensive exam in the next to last semester of their coursework.

For students who have the experience and desire to complete a formal thesis, this option exists. In such cases, students will form a thesis committee and then propose, write and defend a thesis. The successful defense of the thesis will represent the comprehensive exam for the M.Ed. degree but students must complete at least three hours of master's thesis credit (CIED 600V).

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Theatre (THTR)

Michael Riha
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619 Kimpel Hall
479-575-3612
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Weston Wilkerson
Graduate Coordinator
619 Kimpel Hall
479-575-2953
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Department of Theatre Website (<http://fulbright.uark.edu/departments/theatre/>)

Degrees Conferred:

M.F.A. (THTR)

The Master of Fine Arts in Theatre provides a course of advanced studies within the areas of acting, directing, design, and playwriting. It aims to develop in students a high level of understanding and competence in the chosen degree concentration, leading to professional-level employment in performance and design. Considered to be the terminal degree in the creative aspects of theatre, the M.F.A. program provides a 60-hour concentration in a chosen specialty. The degree is awarded following successful fulfillment of a series of academic and performance/production requirements.

M.F.A. in Theatre

Prerequisites to the M.F.A. Program: A student entering graduate studies in the Department of Theatre should have a minimum of 24 semester hours in undergraduate drama/theatre credit. In the event a student does not satisfy this requirement, the student and an adviser will assess the student's needs and establish a plan of study that will prepare the student for advanced degree work. The GRE may be required based on the student's undergraduate GPA in accordance with Graduate School policy.

Admission Procedures: In addition to complying with all Graduate School admission procedures, M.F.A. degree applicants will present an audition and/or portfolio for assessment and evaluation prior to consideration for acceptance.

Degree Requirements: The Master of Fine Arts degree requires 60 hours of approved graduate-level coursework that is focused in one of three study tracks: Performance (Acting and Directing), Playwriting, or Design. Specific course requirements and related production requirements are determined in conference with the particular track adviser. All students will produce a thesis (6 hours credit) prior to graduation. This thesis will take the form of a performance, design or playwriting project with appropriate written research and documentation to support it. Both the proposed thesis project and the final product shall be subject to review and approval by the student's thesis committee.

Each student will be reviewed annually. Departmental faculty will determine whether sufficient progress has been made to warrant continuation into the subsequent year of study and eventual graduation.

A final examination will be administered to all graduating M.F.A. students. This examination will allow students to demonstrate their knowledge and understanding of theatre at a level appropriate to those who have reached the end of their particular course of studies.

All course credits presented for graduation must be graded "C" or better.

Up to 18 hours of credit may be waived for those students entering the M.F.A. program and already holding the M.A. degree in theatre or drama. However, a minimum of 42 hours of graduate-level courses and four regular semesters must be completed on the Fayetteville campus.

Departmental requirements may be waived by the faculty in theatre only upon receipt of evidence of equivalent learning or skill resulting from earlier education or experience. Students not holding a bachelor's degree in drama may be required to take supplemental coursework and/or demonstrate proficiency in the creative areas of drama.

Graduate Faculty

Burrow, Jason E., M.M. (Ohio University), B.M. (University of Arkansas), Assistant Professor, 2015.

Corbett, Benjamin, M.F.A. (University of Pittsburgh), B.A. (University of Dallas), Assistant Professor, 2019.

Dwyer, Mavourneen, M.F.A. (University of Texas at Austin), B.A. (University of Montreal), Instructor, 1998.

Frank, Kate L., M.F.A. (University of Arkansas), B.F.A. (California State University-Los Angeles), Lecturer, 2006.

Herzberg, Amy, M.F.A. (California Institute of the Arts), B.A. (Arizona State University), Distinguished Professor, 1989.

Hicks, Morgan, M.F.A. (University of Arkansas), M.A. (Missouri State University), B.F.A. (Arkansas State University), Teaching Assistant Professor, 2007.

Irish, Shawn D., M.F.A. (University of Arkansas), B.A. (Missouri Southern State University), Assistant Professor, 2013.

Landman, Michael, M.F.A. (Columbia University), B.A. (State University of New York at Binghamton), Associate Professor, 2004.

Lane, Valerie Jean, M.F.A. (Pennsylvania State University), B.F.A. (Memphis College of Art), Instructor, 2008.

Marzolf, Steven, M.F.A. (University of San Diego), B.A. (University of Wisconsin-Green Bay), Lecturer, 2015.

Micheel, Tyler, M.F.A., B.F.A. (Dakota State University), Instructor, 2016.

Millett, Joseph D., M.F.A. (University of Southern California), B.A. (Union College), Visiting Assistant Professor, 2015.

Riha, Michael, M.F.A. (Indiana University at Bloomington), B.F.A. (University of Wisconsin), Professor, 1992.

Siebrits, Helene, M.F.A. (University of California, Los Angeles), B.A. (University of California, Los Angeles), Associate Professor, 2020.

Smith, Benjamin C., M.F.A. (University of Pittsburgh), B.A. (University of Dallas), Assistant Professor, 2019.

Wade, Les, Ph.D. (University of California-Santa Barbara), M.F.A. (University of Georgia), M.A. (Duke University), B.A. (Tulane University), Professor, 2011.

Walch, John S., M.F.A. (University of Texas at Austin), B.A. (Colorado College), Assistant Professor, 2016.

Wilkerson, Weston, M.F.A. (University of Tennessee), B.A. (Texas A&M University), Assistant Professor, 2014.

Courses

THTR 5123. Theatrical Design Rendering Techniques. 3 Hours.

Investigation of drawing and painting methods and materials useful to theatrical designers. Integration of graphic communication with overall production conceptualization will be explored through examination of various theatre styles and periods. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

THTR 5133. Design Portfolio Development. 3 Hours.

Exploration and practice of the skills and techniques used to prepare and present a professional design portfolio and materials in order to successfully interview for a career in the theatre. Prerequisite: Graduate Standing in Theatre or by instructor permission. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

THTR 5143. History of Decor for the Stage. 3 Hours.

An overview of architectural decoration and its application to theatrical design from the Predynastic Period (4400-3200 B.C.) through the Art Deco period with references to contemporary decor. Prerequisite: Graduate standing. (Typically offered: Irregular)

THTR 5151. Singing for Musical Theatre. 1 Hour.

Private study of the singing voice focusing on musical theatre vocal technique and repertoire. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

THTR 5161. Musical Theatre Orchestra. 1 Hour.

A music ensemble class made up of students from all majors who will rehearse together and perform as the pit orchestra for the musical produced by the Department of Theatre. Instrumentation and musical styles vary from show to show. (Typically offered: Irregular) May be repeated for up to 4 hours of degree credit.

THTR 5173. Drafting for the Designer. 3 Hours.

Focuses on industry standard practices of drafting. Students will study and execute design drafting packages for the theatre, including but not limited to Designer Drawings, Painter's Elevations, Props Packages, Lighting Plots and Sections. Prerequisite: Graduate Standing in Theatre or by instructor permission. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

THTR 5183. Scene Design Studio. 3 Hours.

Individual and advanced projects in designing scenery for various theatrical genres as well as non-theatrical applications with emphasis on the design process involving playscript analysis, text analysis, and research. Collaboration skills and advanced rendering techniques will be explored. Contributes to on-going portfolio development. Prerequisite: THTR 4653 or THTR 5653 (formerly THTR 4653) or instructor consent. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

THTR 5193. Scene Technology Studio. 3 Hours.

Individual and advanced projects in scenic techniques with emphasis on scene painting, drafting, rendering, properties design, or scenic crafts as determined by student need. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Spring) May be repeated for up to 9 hours of degree credit.

THTR 5213. Costume Design. 3 Hours.

Advanced study of the art and practice of stage costume design. Emphasis on the expression of character through costume. Development of rendering and research skills. Portfolio development. (Typically offered: Irregular)

THTR 5283. Costume Design Studio. 3 Hours.

Individual and advanced projects in designing costumes for various theatrical genres with emphasis on the design process involving text interpretation, character analysis, and research. Collaboration skills and advanced rendering techniques will be explored. Contributes to on-going portfolio development. Prerequisite: THTR 3213 or THTR 5213 or instructor consent. (Typically offered: Fall) May be repeated for up to 9 hours of degree credit.

THTR 5293. Costume Technology Studio. 3 Hours.

Individual and advanced projects in costume construction and techniques with emphasis on flat pattern, draping, corsetry, tailoring or costume crafts as determined by student need. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Spring) May be repeated for up to 9 hours of degree credit.

THTR 5353. Stage Lighting Technology. 3 Hours.

The thorough examination of the technology of equipment that supports the art of stage lighting design: theory, operating principles and specification of lamps, fixtures, control systems and special effect hardware will be explored. Prerequisite: Graduate standing. (Typically offered: Irregular)

THTR 5383. Lighting Technology Studio. 3 Hours.

Individual and advanced projects in lighting technology with emphasis on light sources, lighting control, equipment design and specification and the mechanics of lighting. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Spring) May be repeated for up to 9 hours of degree credit.

THTR 5393. Lighting Design Studio. 3 Hours.

Individual projects in lighting design with emphasis on the design process involving script interpretation, design aesthetics and research. Lighting design applications to a variety of venues will be studied. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

THTR 5413. African American Theatre History – 1950 to Present. 3 Hours.

(Formerly THTR 4463.) A chronological examination of African-American theatre history from 1950 to the present through the study of African-American plays and political/social conditions. Upon completion of this course the student should be familiar with the major works of African-American theatre and have a deeper understanding of American History. Graduate degree credit will not be given for both THTR 4463 and THTR 5413. (Typically offered: Spring)

THTR 542V. Graduate Acting Studio. 1-3 Hour.

Provides actors with intensive opportunities to explore specific aspects of their craft. Sample topics include characterization, Chekhov, Pinter, Brecht, improvisation and mask work. Topics vary each semester. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

THTR 5432. Graduate Voice and Speech I. 2 Hours.

Teaches how to build clear vocal production using proper breath support, grounded in the Alexander technique. Emphasis on the connection between breath and thought, learning to undo inadequate vocal habits, and vocal hygiene. Prerequisite: Graduate standing in Theatre. (Typically offered: Fall) May be repeated for up to 4 hours of degree credit.

THTR 5443. Graduate Acting: Period Styles. 3 Hours.

Styles of acting in relation to French and English Dramatic Literature (16th-19th Centuries). This course also examines the historical and cultural influences that shaped each genre. A period dance component is included. Prerequisite: Graduate standing in Theatre. (Typically offered: Spring)

THTR 545V. Musical Theatre Performance. 1-3 Hour.

Theory and techniques of performing a singing role for the theatre. Integrates acting and vocal techniques and examines the relationship between score and text. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5463. Audition Techniques. 3 Hours.

A thorough study and practical application of audition skills and techniques. This course will equip the student with prepared audition pieces and experience in cold reading, on-camera work, and improvisation. The course also explores the practical needs of the actor; from how to get an audition to how to prepare a resume. Prerequisite: Graduate standing in Theatre. (Typically offered: Fall, Spring and Summer)

THTR 5473. Graduate Acting: Shakespeare. 3 Hours.

Analysis of Shakespeare for performance. Work will include the plays of Shakespeare and his contemporaries, including cultural and theatrical contexts required for understanding the scripts. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 548V. Meisner Technique I. 1-3 Hour.

Acting theory and exercises of Sanford Meisner, including repetition work, connecting with partner, three moment game, activities, and emotional preparation. (Typically offered: Irregular)

THTR 549V. Meisner Technique II. 1-3 Hour.

Continuation of Meisner Technique I. Incorporation of theory and advanced exercises of the Meisner Technique into the playing of text. Prerequisite: THTR 548V. (Typically offered: Irregular)

THTR 5511. Alexander Technique Lessons. 1 Hour.

Students will become aware of habitual patterns of tension and how these patterns interfere with performance, learning, and overall health. The Technique offers practical skills for improving coordination and for re-gaining a sense of ease of movement in all activities. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

THTR 5523. Writing for Television and Screen. 3 Hours.

Advanced study and practice in writing for the small and big screen, with focus on writing for television. This writing workshop is an investigation into the form, structure, and vocabulary of writing for television, designed to give students tools, strategies, and practice in writing for television. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

THTR 5533. Graduate Playwriting: Special Projects. 3 Hours.

Advanced study and practice in the area of playwriting. The area of concentration will be determined by the student's specific writing project(s). Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

THTR 5543. Creating a One-Person Show. 3 Hours.

Actors learn to use compelling personal experiences and interests in the creation of a unique one-person show. Includes exploration in characterization, staging and playwriting. Culminates in the public presentation of a short one-person show. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5552. Graduate Voice and Speech II. 2 Hours.

A continuation of Graduate Voice and Speech I, exploring more closely the connection between breath support and volume, pitch, range, resonance and articulation. Prerequisite: THTR 5432. (Typically offered: Spring)

THTR 5562. Graduate Voice and Speech III. 2 Hours.

Continuation of Graduate Voice and Speech II, focusing on the classification of vowels and consonants according to the International Phonetic Alphabet (IPA). Prerequisite: THTR 5552. (Typically offered: Irregular)

THTR 5572. Graduate Voice and Speech IV. 2 Hours.

Continuation of Graduate Voice and Speech III. Extension of the application of the IPA to the analysis of different accents of individuals for whom English is a second language. Approximately eight dialects of English will be examined. Prerequisite: THTR 5562. (Typically offered: Irregular)

THTR 5593. Acting and Directing Absurdist Theatre. 3 Hours.

This course focuses on a particular dramatic style that developed following World War II: Absurdism. In scene presentation projects, students will grapple with the unusual challenges acting and directing these plays, as well as explore the cultural contexts, philosophies and theatrical traditions that led to their invention. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5643. Devised Theatre. 3 Hours.

Explores performer-created works developed through group dynamics, with emphasis on innovative source materials and inventive theatrical approaches. (Typically offered: Irregular)

THTR 5653. Scene Design. 3 Hours.

(Formerly THTR 4653.) Theory and practice in the art of scenic design, including historical and contemporary styles and procedures. Graduate degree credit will not be given for both THTR 4653 and THTR 5653. Prerequisite: THTR 1323, THTR 2313 and THTR 2513. (Typically offered: Fall Odd Years)

THTR 5663. Directing Modern Drama. 3 Hours.

Studio course exploring the challenges of directing post-19th Century dramatic literature. Individual projects in collaboration with actors. Sample dramatic literature includes styles such as Realism, Expressionism, Absurdism, post-Modernism and Epic Theatre. Topics vary each semester. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

THTR 5673. Adapting and Directing Non-Theatrical Texts. 3 Hours.

Offers directors practice in the adaptation and staging of non-theatrical prose, poetry and current events. Individual projects in collaboration with actors. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5683. Directing Studio. 3 Hours.

Hands-on exploration into the direction of historical and contemporary texts and styles, including Greek, Roman, Shakespeare, Realism, American and international scripts and the adaptation of non-theatrical material. Topics vary each semester. Includes discussion and investigation of the theatrical arts and collaborative and production processes. Prerequisite: MFA Directing student or instructor consent. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

THTR 5691. Scene Study for Directing Studio. 1 Hour.

Participation as an actor in scenes presented for the graduate Directing Studio course. Varying historical and contemporary texts and styles each semester. Class meets one hour each week, plus outside rehearsals, depending on casting. Prerequisite: Instructor consent. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

THTR 5713. Directing Classics. 3 Hours.

Explores the challenges of directing classic texts. Individual projects in collaboration with actors on a wide variety of pre-20th Century dramatic literature. Topics vary each semester. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

THTR 5723. History of the Theatre I. 3 Hours.

A comprehensive study of the theatre in different cultures and ages, as an institution, as an art, and as a vision of life. (Typically offered: Fall)

THTR 5733. History of the Theatre II. 3 Hours.

A continuation of THTR 5723. (Typically offered: Spring)

THTR 5763. Dramatic Criticism. 3 Hours.

Analysis of critical theories from Aristotle to the present; interrelationships of theatre disciplines as well as the influence of the church, state, and press on dramatic criticism. Prerequisite: Senior or graduate standing. (Typically offered: Irregular)

THTR 5773. Script Analysis. 3 Hours.

Introduces the fundamentals of dramatic structure, in plays from the classical era to the present, with emphasis on how a dramatic work conveys cultural meaning and how it informs the production approaches of actors, directors, and designers. (Typically offered: Irregular)

THTR 5783. Viewpoints. 3 Hours.

Exploration and application of the Viewpoints movement technique. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5833. Scene Painting. 3 Hours.

(Formerly THTR 4833.) A studio class in painting techniques for the theatre. Exercises in color, textures, styles, and execution. Graduate degree credit will not be given for both THTR 4833 and THTR 5833. Prerequisite: THTR 1323 and THTR 2313. (Typically offered: Spring Odd Years) May be repeated for up to 6 hours of degree credit.

THTR 590V. Independent Study. 1-18 Hour.

Individually designed and conducted programs of reading and reporting under guidance of a faculty member. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

THTR 591V. Special Topics. 1-3 Hour.

Classes not listed in the regular curriculum, offered on demand on the basis of student needs and changes within the profession. Prerequisite: Graduate standing in Theatre or Instructor consent required. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

THTR 592V. Internship. 1-6 Hour.

Supervised practice in the various arts and crafts of the theatre (e.g. full design responsibility for a production; box office management; actor apprenticeship in a professional company). (Typically offered: Irregular)

THTR 5953. Theatre Study in Britain. 3 Hours.

(Formerly THTR 4953.) Study of the components of stage production through attending and critiquing a wide variety of classical, modern, and avant garde theatre productions in England; includes tours of London and historical British sites and seminars with British theatre artists. Graduate degree credit will not be given for both THTR 4953 and THTR 5953. (Typically offered: Summer)

THTR 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

THTR 6111. Academic Research I. 1 Hour.

Introduces students to the practice and discipline of academic writing and research. Students are required to write papers throughout the course, in order to become familiar with the formatting criteria of academic writing. Prerequisite: Admission to the MFA Program. (Typically offered: Fall, Spring and Summer)

THTR 6121. Academic Research II. 1 Hour.

The class is intended to finalize to the submission of the thesis proposal at the end of the semester for faculty approval. Lectures and class discussions are designed to further expand students' skills in research, academic writing and formatting requirements. Each student will be assigned a thesis advisor. Prerequisite: THTR 6111. (Typically offered: Fall, Spring and Summer)

THTR 6132. Introduction to the Creative Process. 2 Hours.

Introduces the creative process as a form of practice through exploring various strategies for generating performative material, including the initiation of an impulse, an action or a concept. Involves studio work, exercises, automatic writing, design, and numerous modes of improvisation. (Typically offered: Fall, Spring and Summer)

THTR 6142. Extension and Analysis of the Creative Process. 2 Hours.

Introduction to form and genre via Commedia dell'Arte where students will improvise and construct lazzi within the constraints of a specific form. The fundamental role of musicality and rhythm in dramaturgy will be underlined as students move towards more complex compositional forms. Prerequisite: THTR 6132. (Typically offered: Fall, Spring and Summer)

THTR 6323. Stylized Theatre Practices. 3 Hours.

Constellated around the notion of Composed Theatre and draws on the psycho-physical vocabulary and various dramaturgical approaches. Focuses on generating textual material and composition, with a view to elaborating personal projects. Provides practical and conceptual tools that enable solutions to be found to acting and dramaturgical challenges of creating new work. Prerequisite: THTR 6132. (Typically offered: Fall, Spring and Summer)

THTR 6333. Devised Theatre Practices. 3 Hours.

Works towards an understanding of what 'composed theatre' means focusing on the use of musical concepts and strategies to arrive at a fully formed performance. Focus on the creation of student-driven devised performance projects. Each student will be responsible for devising a short piece to professional standards for public performance. (Typically offered: Fall, Spring and Summer)

THTR 6346. Devised and Physical Theatre Internship. 6 Hours.

Occurs off-site with professional companies. Devised and physical theatre techniques are investigated that supplement or complement the previous semester's study. Requires a journal, a final paper or a final project of the learned technique studied. Prerequisite: Must complete at least 10 hours of credit in 5000 level THTR coursework. (Typically offered: Summer) May be repeated for up to 12 hours of degree credit.

THTR 6351. Improvisation and Text in Commedia dell'Arte. 1 Hour.

Delves into the aesthetic, literary, and technical structures in which are rooted the dramaturgical components of Commedia dell'Arte. Focuses on the processes of improvisation, and makes use of sources such as scenarios, acting treatise and repertoires, lazzi, and iconographic documents. Prerequisite: THTR 6741. (Typically offered: Fall, Spring and Summer)

THTR 6414. Basic Skills of the Physical Actor. 4 Hours.

Designed to enable actors to develop the physical, vocal, musical and rhythmic skills necessary for their craft, including movements, contemporary dance, voice work and music. Introduces the notion of collaborative theatre and the principles of a trans-disciplinary approach to training. Students will create and perform in Italian. Prerequisite: Admission to the MFA program. (Typically offered: Fall, Spring and Summer)

THTR 6423. Extended Skills of the Physical Actor. 3 Hours.

Presents students with demanding work in movement and vocal skills that move towards character-building, autonomous training methods and a deeper understanding of how musicality and rhythm are a key to both individual and ensemble performance. Fundamental design principles are introduced underscoring improvisation and future composition. Prerequisite: THTR 6414. (Typically offered: Fall, Spring and Summer)

THTR 6432. Advanced Skills of the Physical Actor. 2 Hours.

Presents pathways towards generating work both as an ensemble and as soloists. More complex expressive skills are investigated: text work, dance choreography, movement analysis and impulse, musical 'scoring' and dynamo-rhythms in performance. Students encounter advanced design principles that will inform devising. Prerequisite: THTR 6423. (Typically offered: Fall, Spring and Summer)

THTR 6441. Beyond Techniques. 1 Hour.

Tracks students in their final semester focusing on maintaining core fitness and readiness on a physical and vocal level. Students develop further skills in devising, writing and composition in readiness for their thesis projects. Prerequisite: THTR 6432. (Typically offered: Fall, Spring and Summer)

THTR 6471. The Body as Sign. 1 Hour.

Explores the connections between 'meaning' and 'illusion' in examples drawn from theatre, dance and other art forms. Emphasis on the connections displayed by the actor's body. Classes will investigate plays and works of art by focusing on the role the body assumes as a medium of meanings through illusion. Prerequisite: THTR 6731. (Typically offered: Fall, Spring and Summer)

THTR 6513. Ensemble Creation. 3 Hours.

Reinforces the need to maintain a cohesive ensemble where a daily 'routine' is part of a company ethic and practice. Students re-visit their ensemble and individual or small-group works devised during the previous courses. They further refine and define these works under faculty mentoring. Prerequisite: THTR 6333. (Typically offered: Fall, Spring and Summer)

THTR 6611. Professional Aspects of Theatre. 1 Hour.

Introduction to industry through research of professional companies producing work that contains devised and physically - based material. Also covers elements of grant writing, producing on a budget, publicity and promotion. Prerequisite: THTR 6346. (Typically offered: Fall, Spring and Summer)

THTR 6711. Theory, History, and Aesthetics of Physical Theatre I. 1 Hour.

Investigates key physical theatre practitioners within both the realm of classical and modern theories and the conceptual sphere emerging from significant contemporary theatre. Intended to make students aware of the political value of their artistic vision as an aesthetic expression of contemporary society. Prerequisite: Admission to the MFA Program. (Typically offered: Fall, Spring and Summer)

THTR 6721. Theory, History, and Aesthetics of Physical Theatre II. 1 Hour.

Continuation of Aesthetics and History of Physical Theatre I. Focuses on significant contemporary physical theatre practitioners. Investigates productions, techniques, and poetics of current physical theatre companies presently operating. Prerequisite: THTR 6711. (Typically offered: Fall, Spring and Summer)

THTR 6731. Theory, History, and Aesthetics of Physical Theatre III. 1 Hour.

Provides insights into popular theatre practices and practitioners in the broader context of physical theatre. Focuses on the aesthetic, social, political, and economic concerns related to diverse significant popular theatre practices, which were, and still are, alternative to mainstream forms of entertainment: buffoon, clown, and cabaret, among others. Prerequisite: THTR 6721. (Typically offered: Fall, Spring and Summer)

THTR 6741. Non-Western Theatre. 1 Hour.

Introduces students to non-Western theatrical forms, concentrating on the traditional, primarily the theatre of three Asian countries: Japan, China, and India. Explores production methods, performance styles, audiences and social milieus, and will challenge the perception of theatre forms usually not included in the Western canon. Prerequisite: THTR 6111. (Typically offered: Fall, Spring and Summer)

THTR 6811. Technical Theatre for the Physical Performer I. 1 Hour.

Introductory, broad based study of technical theatre focusing on contemporary practices in stage lighting, projection, sound, costume and automation. Emphasis will be placed on the blending of old and emerging technology for use by the physical performer. Corequisite: Lab component. Prerequisite: Admission to the M.F.A. Program. (Typically offered: Fall, Spring and Summer)

THTR 6821. Technical Theatre for the Physical Performer II. 1 Hour.

Introductory, broad based study of technical theatre focusing on equipment used in stage lighting, projection, sound, costume and automation. Emphasis will be placed on the use of standard theatrical equipment for the theatre as well as software typically used in the creation and presentation of live theatre. Corequisite: Lab component. Prerequisite: THTR 6811. (Typically offered: Fall, Spring and Summer)

THTR 6913. Special Topics in Devised and Physical Theatre. 3 Hours.

Topics in the areas of theatre that result in the creation of a devised work in dramatic literature, performance, or design. (Typically offered: Fall, Spring and Summer)

World Languages, Literatures, and Cultures (WLLC) French-German-Spanish

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Department of World Languages, Literatures and Cultures Website (<http://fulbright.uark.edu/departments/world-languages/>)

Degrees Conferred:

M.A. in Modern Languages (MLAN)
M.A. in Spanish (SPAN)

Areas of Concentration: French, German, and Spanish. Supporting courses are offered in Greek and Latin.

Primary Areas of Faculty Research: Please refer to the Department of World Languages, Literatures and Cultures website for detailed information on faculty members and their areas of expertise.

M.A. in Modern Languages

Prerequisites to Degree Program: The student must have a B.A. degree or equivalent from an accredited institution with suitable preparation in the chosen foreign language and be accepted by the department. Deficiencies in undergraduate major or prerequisites for advanced courses may be included in the student's program. The Master of Arts Degree in Modern Languages is offered in two concentrations, German and French.

German Concentration

The Master of Arts Degree in Modern Languages, German Concentration offers course work related to the greater German-speaking world, including Germany, Austria, and Switzerland. The program offers a traditional, canon-centered degree in literary history. Students concentrate primarily on courses investigating literary epochs and particular genres that are focused on literary analysis and research.

Graduates of the program generally continue study at the doctoral level at other institutions or complete alternative licensure or the M.A.T. to teach at the secondary level. Doctoral training in cultural studies and translation is also offered in conjunction with the Comparative Literature and Cultural Studies Program.

Requirements for the Master of Arts Degree Modern Languages, German Concentration: Aside from deficiencies, a minimum of 36 semester hours of course work is required for the degree, six hours of which must be selected from the following courses: WLLC 5023, WLLC 5033, or WLLC 5063. Each candidate must pass a comprehensive examination covering course work and a reading list. Upon admission to this program the candidate will be assigned an adviser who, in consultation with the candidate, will design a suitable program for the candidate. The adviser, in consultation with other members of the department, will select an examination committee for the comprehensive written and oral examinations. Detailed program descriptions, including reading lists and examination procedures, are available from the department.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

French Concentration

The Master of Arts degree in Modern Languages, French Concentration offers course work related to the literary and cultural histories of the greater Francophone world, focusing on France. The program provides advanced preparation in literary analysis and research and offers training for teaching French at the college level, including the most recent technological techniques in teaching foreign languages. Graduates of

the program receive a solid preparation to pursue a Ph.D. or to teach at the college or secondary levels. Our comprehensive curriculum enables students to pursue careers in education, government, international organizations and other business opportunities either abroad or within the United States. In conjunction with the Comparative Literature and Cultural Studies program (CLCS), the program contributes to the master's and Ph.D. programs for students working in either Francophone literature, translation, French literature or French cultural studies.

Requirements for the Master of Arts Degree in Modern Languages,

French Concentration: Aside from deficiencies, a minimum of 36 semester hours is required for the degree; six of the hours must be selected from the following courses: WLLC 5023, WLLC 5033, WLLC 5063 or other approved WLLC courses. Each M.A. candidate will submit a list of their course work to the graduate adviser before taking the comprehensive exam, which is comprised of a written and an oral exam. The content of the M.A. exam covers course work and the reading list. All course selections must be approved by the graduate adviser.

Students should also be aware of Graduate School requirements with regard to master's degrees (p. 451).

Program Description: Students pursuing the M.A. degree in Spanish will choose to follow one of two concentrations.

The first concentration is a traditional M.A. in Hispanic literature and culture with a strong emphasis on literary analysis. This concentration is recommended for students likely to pursue work toward a Ph.D. in literature and cultural studies after completion of the M.A.

The second concentration provides students an alternative track that places more emphasis on coursework in pedagogy, technology in the classroom, and second-language acquisition. This concentration is recommended more for students interested in language teaching, for students who may use the M.S. as a terminal degree in preparation for community college or liberal arts teaching, or for secondary teachers seeking further professional development.

Admission into the Master of Arts in Spanish Program: Admission to the M.A. program in Spanish requires a Bachelor of Arts degree or the equivalent from an accredited institution with suitable preparation in Spanish. Individuals interested in a teaching assistantship should submit an application for graduate assistantship to the Department of World Languages, Literatures and Cultures by February 1. In order to demonstrate oral and written proficiency in Spanish, English speakers applying for a teaching assistantship must send an audio-recorded reading of a literary text in Spanish as well as a writing sample in Spanish on a subject of the applicant's choosing (4-8 pages). Applicants requesting an assistantship must also include three letters of recommendation and a statement of purpose.

Upon admission to the program, the candidate will be assigned an adviser who, in consultation with the candidate, will design a suitable program for the candidate, following these guidelines. The adviser, in consultation with other members of the department, will select an examination committee for the comprehensive oral and written examinations. M.A. comprehensive exams can be taken only two times.

Non-native English speakers applying to the program, and those applying for teaching assistantships, should be sure to consult the English-language admission requirements for both graduate students and teaching assistants at:

- Graduate School English Proficiency page (<https://international-admissions.uark.edu/graduate-studies/english-proficiency.php>)
- Graduate School Admissions page (<http://catalog.uark.edu/graduatecatalog/admissions/>)

Detailed program descriptions, including reading lists and examination procedures, are available from the department.

Students pursuing the Master of Arts in Spanish will choose one of two concentrations. The first concentration is a traditional M.A. in Hispanic literature and culture with a strong emphasis on literary analysis. This concentration is recommended for students likely to pursue work towards a Ph.D. in literature and cultural studies after the completion of the M.A. The second concentration provides students with an alternative to the traditional M.A. in Hispanic literature and culture that places an additional emphasis on coursework in second language acquisition and language teaching. This concentration is recommended for students interested in pursuing a Ph.D. in Spanish applied linguistics after the completion of the M.A., and for those who are interested in language teaching as a career.

Requirements for the Master of Arts in Spanish: Aside from deficiencies, a minimum of 36 graduate credit hours is required for the degree. During their first semester, all students must take WLLC 5063 Teaching Foreign Languages on the College Level. In addition, 24 credit hours of Spanish literature at the 5000-level or higher is required. The remaining 9 credit hours comes from one of two concentrations listed below.

Literature concentration: Students will take SPAN 5703 Special Topics (in literature) or an equivalent research seminar, as approved by the graduate advisor. In this course, students will be required to present a research paper that meets professional research methods and standards. Students will also take an additional 6 credit hours in literature.

The comprehensive examination for the Literature concentration will include five areas of focus. This includes two periods from each tradition (Latin America and Spain) and at least two periods before 1900. The periods of concentration are Colonial, 19th century, 20th/21st century, and U.S. Latino/a for Latin America, and Medieval, Golden Age, 19th century, and 20th/21st century for Spain.

Language Learning and Teaching concentration: Students will take SPAN 5703 Special Topics (in language learning and teaching) or an equivalent research seminar, as approved by the graduate advisor. In this course, students will be required to present a research paper that meets professional research methods and standards. Students will also take an additional 6 credit hours in language learning and teaching.

For the Language Learning and Teaching concentration, the comprehensive examination will include five areas of focus. One area will be language learning and teaching. The four others will consist of literature and culture from four historical periods of the Hispanic world, including at least one period from each tradition (Latin America and Spain) and at least one period before 1900. The periods of concentration are Colonial, 19th century, 20th/21st century, and U.S. Latino/a for Latin America, and Medieval, Golden Age, 19th century, and 20th/21st century for Spain.

Literature Concentration

Requirements for the Spanish M.A. Literature Concentration:

6 credit hours of additional Spanish literature at the 5000-level or higher	6
SPAN 5703 Special Topics (in literature) or an equivalent research seminar in literature, as approved by the graduate advisor	3
Total Hours	9

Language Learning and Teaching Concentration

Requirements for the Spanish M.A. Language Learning and Teaching Concentration:

6 credit hours of additional language learning and teaching courses	6
SPAN 5703 Special Topics (in language learning and teaching) or an equivalent research seminar in language learning and teaching, as approved by the graduate advisor	3
Total Hours	9

Graduate Faculty

- Almenara, Erika**, Ph.D. (University of Michigan), M.A. (University of Wisconsin-Milwaukee), B.A. (Feminine University of the Sacred Heart), Assistant Professor, 2015.
- Arenberg, Nancy M.**, Ph.D. (University of Arizona), M.A. (University of Illinois, Champaign-Urbana), B.A. (Grinnell College), Associate Professor, 1996.
- Bell, Steven M.**, Ph.D. (University of Kansas), M.A. (University of Kentucky), B.A. (University of Kansas), Associate Professor, 1992.
- Berkovich, Nadja**, Ph.D. (University of Illinois), M.A. (Boston College), B.A. (St. Petersburg Pedagogical Herzen University), Clinical Assistant Professor, 2015.
- Brito, Edvan P.**, Ph.D., M.S. (Georgetown University), M.A. (Howard University), B.A. (Universidade de São Paulo, Brazil), Assistant Professor, 2016.
- Calabretta-Sajder, Ryan C.**, Ph.D. (Middlebury College), M.A. (Indiana University-Bloomington), B.A. (Dominican University), Assistant Professor, 2013.
- Castro Salas, Raquel**, M.A. (University of Arkansas), B.A. (John Brown University), Instructor, 2014.
- Christiansen, Hope L.**, Ph.D. (University of Kansas), M.A., B.A. (Kansas State University), Associate Professor, 1990.
- Clowney, Nicole**, J.D. (Yale University), M.A. (University of Kentucky), B.A. (University of Chicago), Lecturer, 2014.
- Comfort, Kathy**, Ph.D. (University of Kansas), M.A., B.A. (Illinois State University), Associate Professor, 2001.
- Condray, Kathleen**, Ph.D., M.A. (University of Illinois-Urbana-Champaign), B.A. (University of Arkansas), Associate Professor, 1999.
- Foote, Rebecca K.**, Ph.D. (University of Illinois at Urbana-Champaign), M.A. (Rice University), B.A. (University of Houston), Assistant Professor, 2017.
- Fredrick, David Charles**, Ph.D. (University of Southern California), M.A., B.A. (University of Kansas), Associate Professor, 1991.
- Fukushima, Tatsuya**, Ph.D., M.A. (Oklahoma State University), B.A. (Kanto Gakuin University, Japan), Associate Professor, 2000.
- Haydar, Adnan Fuad**, Ph.D. (University of California-San Diego), M.A., B.A. (American University of Beirut), Professor, 1993.
- Haydar, Paula Marie**, Ph.D., M.F.A. (University of Arkansas), M.Ed., B.S. (University of Massachusetts), Clinical Assistant Professor, 2006.
- Hernandez-Miranda, Michael**, Ph.D., M.A. (Texas A&M University), B.A. (University of Oriente), Instructor, 2015.

Hinds, Heather Rae, M.A. (University of Arkansas), B.S. (University of Central Missouri), Instructor, 2008.

Hoyer, Jennifer M., Ph.D., M.A. (University of Minnesota-Twin Cities), B.A. (University of Tulsa), Associate Professor, 2007.

Jones, Linda Carol, Ph.D. (University of New Mexico), M.A. (University of Arkansas), M.A. (University of Arizona), B.A. (Northeast Louisiana University), Associate Professor, 1988.

Levine, Daniel, Ph.D. (University of Cincinnati), B.A. (University of Minnesota), University Professor, 1980.

Lorenzo, Violeta, Ph.D. (University of Toronto), M.A., B.A. (University of Florida), Assistant Professor, 2014.

Magnetti, Brenda Monica, M.A. (University of Arkansas), B.A. (Ouachita Baptist University), Instructor, 2007.

Mahmoud, Rania, Ph.D. (University of Washington), M.A. (Old Dominion University), B.A., (University of Alexandria, Egypt), Assistant Professor, 2017.

Omura, Mafumi, M.A. (University of Iowa), B.A. (Kansai Gaidai University), Instructor, 2016.

Pérez Arroyo, Elkin Javier, M.A. (University of Arkansas), B.A. (Universidad de Córdoba, Montería, Colombia), Instructor, 2017.

Reeber, Joy Elisabeth, Ph.D., M.A. (University of Wisconsin-Madison), B.A. (University of North Carolina), Instructor, 2012.

Restrepo, Luis Fernando, Ph.D., M.A. (University of Maryland-College Park), B.A. (Universidad Pontificia Bolivariana), University Professor, 1995.

Rozier, Louise L., D.M.L. (Middlebury College), M.A. (University of Arkansas), B.A. (Licence es Lettres, Université de Besançon, France), Associate Professor, 1991.

Ruiz, M. Reina, Ph.D. (Washington University in St. Louis), M.A. (Kansas State University), B.A. (University of Leon, Spain), Associate Professor, 2001.

Ruiz-Blanco, Angel, Ph.D. (University of California, Davis), Clinical Assistant Professor, 2019.

Sterling, Brett E., Ph.D., M.A. (Vanderbilt University), B.A. (University of Arkansas), Assistant Professor, 2013.

Su, Danjie, Ph.D. (University of California, Los Angeles), M.A., B.A. (Sun Yatsen University, China), Assistant Professor, 2017.

Ten Haaf, Rachel E., Ph.D. (University of Michigan), M.A. (University of Illinois, Urbana-Champaign), Assistant Professor, 2016.

Vennarucci, Rhodora, Ph.D., M.A. (State University of New York at Buffalo), B.A. (University of Michigan), Assistant Professor, 2013.

Arabic Courses

ARAB 570V. Special Topics. 1-6 Hour.

(Formerly ARAB 470V.) May be offered in a topic not specifically covered by courses otherwise listed. Graduate degree credit will not be given for both ARAB 470V and ARAB 570V. (Typically offered: Irregular) May be repeated for degree credit.

French Courses

FREN 5003. French Grammar and Phonetics. 3 Hours.

Systematic review of principles of French grammar and syntax; comprehensive presentation of French phonetics. (Typically offered: Irregular)

FREN 5033. Advanced French Conversation. 3 Hours.

This course will provide a small discussion environment in which graduate students will improve their command of spoken French in an interactive setting. Discussion will concentrate on current cultural issues in the French speaking world. (Typically offered: Irregular)

FREN 5333. Old French Literature. 3 Hours.

An intensive study of French Medieval Literature from the Chansons de Geste to Villon, including an in-depth analysis of the genres and their evolution, and of the major authors of the times. (Typically offered: Irregular)

FREN 5353. Survey of French Poetry. 3 Hours.

A comprehensive study of French poetry from the Middle Ages to the twentieth century, focusing on close readings of individual poems. This course will cover literary movements and trends of the periods and presents the terminology required to do explication de texte. (Typically offered: Irregular)

FREN 5433. French 16th-Century Literature. 3 Hours.

A survey of representative writers of the sixteenth century. (Typically offered: Irregular)

FREN 5543. French 17th-Century Literature. 3 Hours.

A survey of representative writers of the seventeenth century. (Typically offered: Irregular)

FREN 5673. French 18th-Century Literature. 3 Hours.

French 18th-Century literature. (Typically offered: Irregular)

FREN 5703. Special Topics. 3 Hours.

May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

FREN 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

FREN 5773. Survey of Francophone Literature. 3 Hours.

A survey of representative texts in the field of sub-Saharan and North African literature concentrating on postcolonial novels using contemporary critical approaches. (Typically offered: Irregular)

FREN 5783. The French Nineteenth-Century Novel. 3 Hours.

The French Nineteenth-Century novel. (Typically offered: Irregular)

FREN 5833. French 20th-Century Novel. 3 Hours.

French 20th-Century novel. (Typically offered: Irregular)

German Courses

GERM 5013. Germany and the Holocaust: The Significance of the Holocaust in Differentiated Contexts. 3 Hours.

(Formerly GERM 4013.) Taught in English. Topics covering the role of the Holocaust in German history, culture, art, language and German Studies. Equal emphasis will be placed on historical competence and philosophical/theoretical inquiry, addressed from a variety of media and primary and secondary sources. Graduate degree credit will not be given for both GERM 4013 and GERM 5013. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

GERM 5043. German Cinema. 3 Hours.

(Formerly GERM 4043.) Presents a range of German films in cultural-historical context; vocabulary and structures for discussing film, film history, and film theory in German. Graduate degree credit will not be given for both GERM 4043 and GERM 5043. Prerequisite: GERM 3003. (Typically offered: Irregular)

GERM 5123. The German Novella. 3 Hours.

An intensive study of the novella as a genre from its origin to the present. Prerequisite: GERM 3013. (Typically offered: Irregular)

GERM 5133. The German Drama. 3 Hours.

A study of the development of the forms and themes of the German drama from the middle ages to the present. Prerequisite: GERM 3013. (Typically offered: Irregular)

GERM 5143. German Lyric Poetry. 3 Hours.

A study of the forms and themes of German lyric poetry from the middle ages to the present. (Typically offered: Irregular)

GERM 5223. Early German Literature: Middle Ages to the Enlightenment. 3 Hours.

Early German literature. (Typically offered: Irregular)

GERM 5273. German Literature: Enlightenment, Storm and Stress, and Classicism. 3 Hours.

German literature. (Typically offered: Irregular)

GERM 5343. Early Modern German Literature: Late 19th and Early 20th Century. 3 Hours.

Early modern German literature. (Typically offered: Irregular)

GERM 5363. German Literature after 1945. 3 Hours.

German literature after 1945. (Typically offered: Irregular)

GERM 5703. Special Topics. 3 Hours.

May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Greek Courses

GREK 5003. Greek Lyric Poetry. 3 Hours.

(Formerly GREK 4003.) Readings from selected Greek lyric poems, to be chosen from several appropriate authors from the 7th through the 5th centuries BCE: Archilochus, Hipponax, Sappho, Alcaeus, Tyrtaeus, Mimnermus, Semonides, Solon, Xenophanes, Theognis, Pindar, Bacchylides. Graduate degree credit will not be given for both GREK 4003 and GREK 5003. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5013. Greek Epic Poetry. 3 Hours.

(Formerly GREK 4013.) Study of the primary works of Greek hexameter poetry, including Homer, Hesiod, and/or the Homeric Hymns, with special attention to issues of oral composition and performance. Graduate degree credit will not be given for both GREK 4013 and GREK 5013. Prerequisite: GREK 2013. (Typically offered: Irregular)

GREK 5023. Greek Philosophy. 3 Hours.

(Formerly GREK 4023.) Study of representative works of Greek philosophy, including those of the Pre-Socratics, Plato, and/or Aristotle. Graduate degree credit will not be given for both GREK 4023 and GREK 5023. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5033. Herodotus or Thucydides. 3 Hours.

(Formerly GREK 4033.) Readings of Herodotus, Book VII, and Thucydides, Book VI; collateral readings on the Persian and Peloponnesian Wars. Graduate degree credit will not be given for both GREK 4033 and GREK 5033. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5043. Greek Drama. 3 Hours.

(Formerly GREK 4043.) Readings of two tragedies and one comedy; a study of the Greek theatre. Graduate degree credit will not be given for both GREK 4043 and GREK 5043. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5053. Greek Syntax and Composition. 3 Hours.

(Formerly GREK 4053.) Greek syntax and composition. Graduate degree credit will not be given for both GREK 4053 and GREK 5053. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5063. Hellenistic Poetry. 3 Hours.

(Formerly GREK 4063.) Selections from significant post-classical authors, including Callimachus, Theocritus, Bion, Moschus, Herondas, Apollonios of Rhodes, and/or poets of the Greek Anthology. Special attention to archaic and classical influences, contemporary Hellenistic culture, and Roman responses. Graduate degree credit will not be given for both GREK 4063 and GREK 5063. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5073. Ancient Greek Novel. 3 Hours.

(Formerly GREK 4073.) Study of the development of the Greek novel including the works of Lucian, Longus, Heliodorus, and/or Achilles Tatius. Graduate degree credit will not be given for both GREK 4073 and GREK 5073. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5083. Greek Epigraphy. 3 Hours.

(Formerly GREK 4083.) Study of inscriptions, especially Attic, in their historical and social contexts, from the 8th century BCE to the Hellenistic/Roman period. Training in epigraphical conventions and symbols. Graduate degree credit will not be given for both GREK 4083 and GREK 5083. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5093. Biblical and Patristic Greek. 3 Hours.

(Formerly GREK 4093.) Selected readings from appropriate texts, varying by semester, including the Septuagint, New Testament, Apostolic Fathers, and other patristic literature to the 5th century CE. Reading and discussion of selected texts in major genres. Graduate degree credit will not be given for both GREK 4093 and GREK 5093. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5103. Greek Oratory. 3 Hours.

(Formerly GREK 4103.) Readings from selected speeches, to be chosen from one or more appropriate authors: Lysias, Antiphon, Demosthenes, Isocrates, Andocides. Study of sophism and rhetoric of Athens in the 5th and 4th centuries BCE. Graduate degree credit will not be given for both GREK 4103 and GREK 5103. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

Japanese Courses

JAPN 5313. Language and Society of Japan. 3 Hours.

(Formerly JAPN 4313.) The primary objective of this course is to investigate the way the Japanese language reflects the beliefs and custom of the Japanese people as a social group. For comparison purposes, this course makes reference to studies in American language and culture. Proficiency in Japanese not required. Graduate degree credit will not be given for both JAPN 4313 and JAPN 5313. (Typically offered: Fall)

JAPN 5333. Professional Japanese I: Business Writing. 3 Hours.

(Formerly JAPN 4333.) This course aims to familiarize the students with formats, vocabulary, and expressions in Japanese business correspondence. Emphasizes career-ready Japanese language proficiency. Graduate degree credit will not be given for both JAPN 4333 and JAPN 5333. Prerequisite: JAPN 3116 or equivalent Japanese proficiency. (Typically offered: Spring)

Russian Courses

RUSS 5113. Special Themes in Russian. 3 Hours.

Covers topics not normally dealt with in period courses. Sample topics include gender and sexuality, war and memory, Holocaust, art and protest, modernism/post-modernism, Jewish writers, and cinema. Topics announced one semester in advance. This course is taught in English. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

RUSS 5123. Survey of Russian Literature from Its Beginning to the 1917 Revolution. 3 Hours.

(Formerly RUSS 4123.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English. Graduate degree credit will not be given for both RUSS 4123 and RUSS 5123. (Typically offered: Irregular)

RUSS 5133. Survey of Russian Literature Since the 1917 Revolution. 3 Hours.
(Formerly RUSS 4133.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English with readings in English. Graduate degree credit will not be given for both RUSS 4133 and RUSS 5133. (Typically offered: Irregular)
This course is cross-listed with WLIT 5133.

RUSS 575V. Special Investigations. 1-6 Hour.
Special investigations. (Typically offered: Fall and Spring) May be repeated for degree credit.

Spanish Courses

SPAN 5073. Introduction to Hispanic Linguistics. 3 Hours.
Deepens students' knowledge of the Spanish language through an introduction to the discipline of Linguistics, which is the field of science that studies human language. Areas of Hispanic linguistics that will be covered include phonology (sound system), morphology (word structure), and syntax (sentence structure). (Typically offered: Irregular)

SPAN 5203. Medieval Spanish Literature. 3 Hours.
From the 'Jarchas' to the Celestina. (Typically offered: Irregular)

SPAN 5233. Golden Age Novel. 3 Hours.
Major works of Spanish prose fiction from the 16th and 17th centuries, with close reading of major works. (Typically offered: Irregular)

SPAN 5243. Golden Age Poetry and Drama. 3 Hours.
History and development of those genres in the 16th and 17th centuries, with close reading of major works. (Typically offered: Irregular)

SPAN 5253. Colonial Literature and Culture. 3 Hours.
An introductory course to the history, culture and literature of colonial Spanish America from 1492 until 1810. The course will cover representative colonial and indigenous texts and their contexts including Renaissance, Baroque, and travel literature of the Eighteenth Century. The course will be taught in Spanish. (Typically offered: Irregular)

SPAN 5273. Survey of 19th Century Spanish Literature. 3 Hours.
A graduate-level survey of Spanish literature from Neoclassicism to the Generation of 1898. (Typically offered: Irregular)

SPAN 5283. Survey of Contemporary Spanish Literature. 3 Hours.
A graduate-level survey of Spanish literature from the Transition to the present. (Typically offered: Irregular)

SPAN 5343. Survey of 20th Century Spanish Literature. 3 Hours.
A graduate-level survey of Spanish literature from the Generation of 1898 to the Transition. Prerequisite: Graduate standing. (Typically offered: Irregular)

SPAN 5393. 19th Century Spanish American Literature. 3 Hours.
Study of representative literary works from Independence (1810) to 1900's. The course covers Neoclassicism, Romanticism, Realism/Naturalism, and Modernism and the role of literature in the nation-building process. The course will be taught in Spanish. (Typically offered: Irregular)

SPAN 5403. Spanish American Theatre. 3 Hours.
Historical examination of the theatre in Spanish America, with close analysis particularly of representative works and movements in the 20th century. (Typically offered: Irregular)

SPAN 5463. 20th Century Spanish American Literature. 3 Hours.
Critical survey of major movements and outstanding and representative works in 20th century prose and poetry, from the Mexican Revolution and the avant-garde to the contemporary boom and post-boom. (Typically offered: Irregular)

SPAN 5563. Latino Youth Biliteracy Service Learning Project. 3 Hours.
The Latino Youth Biliteracy Project is a service learning course for students in Spanish and Latin American and Latino Studies. Readings on Latino education policies and challenges, bilingualism, and the immigrant experience. Students commit from 15 to 30 hours of mentoring Latino youth at local schools during the semester (in addition to class meeting times) and complete a research project on Latino education. Prerequisite: Graduate standing. (Typically offered: Irregular)

SPAN 5703. Special Topics. 3 Hours.
May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SPAN 575V. Special Investigations. 1-6 Hour.
Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

SPAN 5773. Indigenismo Literature. 3 Hours.
A study of 'indigenismo', an intellectual and literary tradition in Latin America examining the history of exploitation and marginalization of indigenous peoples. Readings include texts by Mariategui, Icaza, Andrade, Asturias, Arguedas, Castellanos, and also 'indigenista' works in music and the plastic arts. (Typically offered: Irregular)

SPAN 5943. U.S. Latino/a Literatures and Cultures. 3 Hours.
Explores the construction and negotiation of Latino/a identities through the study of literary and filmic texts. Theoretical concepts (e.g. latinidad, latinization, intra-latino, cultural remittances) will also be studied. Topics of discussion may include: transnationalism, bilingualism, and interactions between different Latino groups. Taught in Spanish. Prerequisite: Graduate standing. (Typically offered: Irregular)

World Languages, Literatures and Cultures Courses

WLLC 5023. Languages, Cultures, and Teaching with Technology. 3 Hours.
This course provides graduate students with innovative ways to teach and communicate through the use of modern technologies as applied to second languages. Topics of discussion include instructional systems design, Web 2.0 technologies, presentation technologies, online facilitation, and pedagogical strategies for using technological tools in language and culture courses. Prerequisite: Graduate standing. (Typically offered: Fall)

WLLC 5033. Languages, Cultures and Teaching with Video. 3 Hours.
This course provides graduate students with the knowledge and skills needed to teach and communicate through the use of video as applied to second languages. Topics of discussion include instructional systems design, development of strong pedagogical strategies for teaching with film, analysis of research focused on subtitling, learning strategies, mental effort, and language and culture development, as well as some videotaping and editing. (Typically offered: Spring)

WLLC 504V. Translation Workshop. 1-6 Hour.
Problems of translation and the role of the translator as both scholar and creative writer; involves primarily the discussion in workshop of the translations of poetry, drama, and fiction done by the students, some emphasis upon comparative studies of existing translations of well-known works. Primary material will vary. Prerequisite: Reading knowledge of a foreign language. (Typically offered: Irregular)
This course is cross-listed with ENGL 5043.

WLLC 5063. Teaching Foreign Languages on the College Level. 3 Hours.
Focus on basic methodological concepts and their practical application to college foreign language instruction. (Typically offered: Irregular)

WLLC 5463. Descriptive Linguistics. 3 Hours.
A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall)
This course is cross-listed with ANTH 5473, ENGL 5463.

WLLC 5723. Language Learning Research and Theory. 3 Hours.

Introduces research and theory in the field of second language learning and acquisition. Develops the ability to critically read and assess published research, while connecting with current theories of how languages are learned. Also introduces the process of carrying out research in language learning. A research project proposal is required. (Typically offered: Irregular)

WLLC 575V. Special Investigations. 1-6 Hour.

Special investigations in world languages, literatures and cultures. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLLC 6553. Applied Linguistics Seminar. 3 Hours.

Research and discussion in areas of applied linguistics ranging from discourse analysis, literacy, language pedagogy, and language planning to translation theory. Subject matter changes depending on student interest and faculty expertise. Prerequisite: WLLC 5463 or equivalent introduction to linguistics. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

Graduate Certificates

The following graduate certificate programs are offered by the University of Arkansas Graduate School:

Graduate School of Business

- Business (p. 380)
- Enterprise Systems (p. 392)
- Entrepreneurship (p. 380)

Department of Computer Science and Computer Engineering (CSCE)

- Cybersecurity (p. 341) (CYBRGC)

Department of Curriculum & Instruction (CIED)

- Applied Behavior Analysis (p. 310) (APBAGC)
- Arkansas Curriculum/Program Administrator (p. 337) (ACPAMC)
- Autism Spectrum Disorders (p. 310) (AUTSGC)
- Building-Level Administration (p. 338) (PSBLMC)
- District-Level Administration (p. 341) (PSDLMC)
- K-12 Online Teaching (p. 118) (ETECGC)
- Special Education Transition Services (p. 349) (SPTSGC)
- STEM Education for K-6 (p. 349) (STEMGC)
- Teaching English to Speakers of Other Languages (p. 350) (TESLGC)

Department of English

- Technical Writing and Public Rhetorics (p. 128) (TWRHGC)

Program in Educational Statistics & Research Methods (ESRM)

- Educational Psychology (p. 116) (EDPSMC)
- Educational Statistics & Research Methods (p. 116) (EDSTMC)

Department of Geosciences

- Geospatial Technologies (p. 148) (GISTGC)

Department of Industrial Engineering

- Homeland Security (p. 346) (OMHSGC)
- Lean Six Sigma (p. 347) (OMLSGC)
- Project Management (p. 348) (OMPMGC)

Interdisciplinary Studies

- African and African American Studies (p. 335) (AASTGC)
- Cross-Sector Alliances (p. 341) (CSALGC)
- Statistics and Analytics (p. 349) (STANGC)
- Sustainability (p. 350) (SUSTGC)

Department of Music (MUSC)

- Advanced Performance (p. 226) (MUSCGC)
- Music Education for Special Needs Students (p. 347) (MESNGC)

Operations Management Program

- Homeland Security (p. 346) (OMHSGC)
- Lean Six Sigma (p. 347) (OMLSGC)
- Project Management (p. 348) (OMPMGC)

Department of Rehabilitation, Human Resources and Communication Disorders (RHRC)

- Advanced School-Based Speech Language Pathology (p. 335) (ASLPMC)

School of Law

- Business Law (p. 338) (BLAWGC)
- Criminal Law (p. 339) (CRLWGC)

Advanced Performance (MUSC)

Ronda Mains
Chair, Department of Music
201 Music Building
479-575-4701
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Er-Gene Kahng
Director of Graduate Advising
201 Music Building
479-575-4701
E-mail: ekahng@uark.edu (sgates@uark.edu)

Department of Music Website (<http://www.uark.edu/depts/uamusic/>)

The Graduate Certificate in Advanced Performance is a performance-intensive program for students who already possess the Master of Music or its equivalent. It is designed for all areas of applied study, and is intended for the advanced performer. (Note: The graduate certificate is not a degree.)

Prerequisites to the Graduate Certificate: To enter this program, students must be admitted by the Graduate School and should consult with the Director of Graduate Studies in Music for the specific area of study in which they are interested. The Department Chair and the Director of Graduate Studies in Music, in consultation with the faculty of the specific area, will determine acceptance, provisional acceptance

contingent on the making up of specific deficiencies, or rejection of the student for admission to the program in the specific area of concentration.

Requirements for the Graduate Certificate: In addition to the general requirements of the Graduate School the following conditions must be met:

1. All students seeking admission to the program for the Graduate Certificate must show evidence of outstanding performance aptitude and proficiency and demonstrate clear potential for a career as a professional musician.
2. All applicants must present an audition with advanced repertoire encompassing four different style periods and not lasting less than 30 minutes.
3. All applicants must display proficiency in music theory and history at the Master of Music level or equivalent through transcripts or an entry examination.
4. At the end of the program the student must present a full length recital (ca. 70 min).

The programs of study are listed below. All course selections are subject to the approval of the graduate adviser in consultation with the applied teacher.

Course Requirements: 16 hours

I. Applied Music

MUAP 510V	Applied Voice/Instrument	9
MUAP 5201	Graduate Recital I	1

II. Electives 6

To be selected from music courses at the 4000-6000 level with the consent of the adviser. Possible areas of study include composition, conducting, chamber music, music theory, and music history.

Areas of applied music concentration: Piano, violin, viola, violoncello, string bass, clarinet, bassoon, flute, oboe, alto saxophone, French horn, trombone, baritone, tuba, trumpet, percussion.

Total Hours 16

Advanced School-Based Speech-Language Pathology (ASLP)

Michael Hevel
 Department Head, Rehabilitation, Human Resources and Communication Disorders
 100 Graduate Education Building
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Rachel Glade
 Program Director
 262 Epley Center for Health Professions
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Post-Master's Certificate Offered:

Advanced School-Based Speech-Language Pathology (ASLP)

Program Description: The post master's Advanced School-Based Speech-Language Pathology Certificate is an online 15-hour graduate program targeting school-based speech-language pathologists who seek to build their content expertise and improve their career mobility. The overall goal of this program is to improve the preparation of school-

based speech-language pathologists that will correspondingly improve the quality of speech therapy service provision in educational settings.

Admission Requirements: The program is designed for individuals with a master's degree in speech-language pathology or related field in communication disorders from a program accredited by the American Speech-Language-Hearing Association (ASHA).

Program Requirements:

CDIS 6103	Literacy for Learning in Educational Settings	3
CDIS 6203	Advanced Assessment and Intervention for Fluency Disorders	3
CDIS 6303	Effective Augmentative and Alternative Communication Services in Schools	3
CDIS 6403	Advanced Pediatric Feeding and Swallowing Assessment & Intervention	3
CDIS 6503	Behavioral Management in Educational Settings	3
Total Hours		15

African and African American Studies

Valandra
 Program Director
 School of Social Work 108-A
 479-575-3001
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Brandon A. Jackson
 Graduate Coordinator
 School of Social Work 108-A
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 brandonj@uark.edu
 aast.uark.edu (<http://aast.uark.edu/>)

African and African American Studies Website (<http://aast.uark.edu/>)

Graduate Certificate offered (non-degree):

African and African American Studies

Program Description: The African and African American Studies program promotes an interdisciplinary approach to the study of the history, culture, and identity of Africans and African Americans. Graduate students may pursue an African and African American Studies Graduate Certificate after making application to the African and African American Studies program and the Graduate School.

Graduate Certificate in African and African American Studies

Admission Requirements:

The following materials must be submitted to the Director of the AAST Program:

1. Application for Admission to the Certificate Program in African & African American Studies. The form is available from the Program Director and the program's Web page.
2. Confirmation of admission to the University of Arkansas Graduate School.
3. Complete official transcripts of all undergraduate and graduate work.

- Three letters of recommendation from former teachers, employers, or supervisors.
- Statement of purpose describing academic interests and professional goals and how the Graduate Certificate fits into them.

Requirements for Graduate Certificate in African and African American Studies

In order to complete the Graduate Certificate in African & African American Studies, students must complete a total of 15 hours of coursework, which must include AAST 5003 Graduate Seminar in African & African American Studies.

The remaining 12 hours of coursework must be approved by the Program Director and adhere to the following stipulations:

- A maximum of 9 of the 12 may come from courses taken in a single department
- A maximum of 3 hours may be earned through AAST 5913 Independent Study in African and African American Studies or AAST 5103 Graduate Readings in African & African American Studies

Possible Courses:

AAST 5913	Independent Study in African and African American Studies	3
AAST 5903	Special Topics in African & African American Studies	3
AAST 6023	Destabilizing Queer Theory	3
AAST 6963	Visualizing Critical Race Theory	3
ENGL 6853	Seminar in African American Literature and Culture	3
HIST 6093	The History of African Americans and Social Justice	3
HIST 6623	Africa and the Trans-Atlantic Slave Trade	3
HIST 6263	Independence and Africa Today	3
HIST 6273	Comparative Slavery	3
HIST 5563	The Old South, 1607-1865	3
HIST 5573	The New South, 1860 to the Present	3
HIST 5823	Black Freedom in the Age of Emancipation	3
PLSC 5993	African American Political Ideology	3
THTR 5413	African American Theatre History -- 1950 to Present	3
PLSC 5253	Politics of Race and Ethnicity	3
PLSC 6963	Visualizing Critical Race Theory	3

Additional courses numbered 5000 or higher may be approved by the Program Director for the Graduate Certificate if its subject matter focuses on the study of Africans or African Americans.

Courses

AAST 5003. Graduate Seminar in African & African American Studies. 3 Hours. Introduction to graduate study of African & African American Studies through an interdisciplinary examination of the history of the discipline, research methods employed, and its relationship to other disciplines. (Typically offered: Irregular)

AAST 5103. Graduate Readings in African & African American Studies. 3 Hours.

An exploration of African & African American Studies topics independently with a faculty member. Topic variable with permission of faculty member. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

AAST 5903. Special Topics in African & African American Studies. 3 Hours. Graduate level seminar with varied emphasis on topics relating to African & African American studies. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

AAST 5913. Independent Study in African and African American Studies. 3 Hours.

Graduate level independent study course with varied emphasis on topics relating to African and African American studies. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

AAST 6023. Destabilizing Queer Theory. 3 Hours.

Highlights constricted and racialized ways in which people generally visualize class, gender, race, and sexualities. Students will discuss the criticality of complex dynamics of visual politics in class, gender, race, and sexualities, and theoretical issues posed and negotiated by queer theory. (Typically offered: Irregular) This course is cross-listed with ARED 6023.

AAST 6963. Visualizing Critical Race Theory. 3 Hours.

An examination of critical theoretical approaches to the concepts of race and racism. Students will examine the ways in which these constructs perform a critical function in the construction of race(s) and racism(s) and their relevance to visual culture. (Typically offered: Fall and Spring) This course is cross-listed with PLSC 6963, ARED 6963.

Applied Behavior Analysis (APBA)

Ed Bengtson
Head, Department of Curriculum and Instruction
206 Peabody Hall
479-575-4209
Email: egbengts@uark.edu

Elizabeth Lorah
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479-575-6210
Email: lorah@uark.edu

Graduate Certificate Offered:
Applied Behavior Analysis (non-degree)(APBA)

Graduate Certificate Program in Applied Behavior Analysis (APBA):

The Graduate Certificate in Applied Behavior Analysis is for those individuals who wish to pursue board certification in behavior analysis. The program builds on candidate's previous knowledge of behavior strategies and extends knowledge and skills in the use of applied behavior analysis. Classes emphasize the development and ethical use of behavior change programs that are validated by systematic evaluation of the interventions used. Ethical, professional, and legal standards are discussed and used in relation to applied behavior analysis.

Admission requirements for the graduate certificate program include: A minimum 3.00 cumulative GPA during the last 60 hours of undergraduate work.

Program of Study

SPED 6843	Basic Principles of ABA	3
SPED 6853	Behavioral Assessment in ABA	3
SPED 6863	Behavior Change Procedures and Supports	3
SPED 6873	Measurement and Experimental Design	3
SPED 6883	ABA Ethical, Professional, and Legal Standards	3
SPED 6453	Human Performance Improvement	3

SPED 6463	Concepts and Principles in Behavior Analysis	3
Total Hours		21

Candidates for the graduate certificate must have a B or higher in the program of study. Courses from other institutions will not be substituted for the required courses. The Graduate Certificate in Applied Behavior Analysis can be infused into the Master of Special Education degree program.

Arkansas Curriculum/Program Administrator (ACPA)

Ed Bengtson
Head, Department of Curriculum and Instruction
216 Peabody Hall
479-575-4209
Email: egbengts@uark.edu

Admission to the Graduate Certificate Program in Arkansas

Curriculum/Program Administrator: Applicants must meet university requirements for admission to the Graduate School as non-degree-seeking, but certificate-seeking students, and must have a master's degree. In addition, to receive the graduate certificate in district-level administration, applicants must have a valid teaching license and a valid building-level administration license.

Admission to the Graduate Certificate program: Applicants must meet university requirements for admission to the Graduate School as non-degree-seeking, but certificate-seeking students, and must have a master's degree in one of the three following fields: Education, Educational Leadership, or Special Education.

Requirements for the Graduate Certificate in Arkansas Curriculum/Program Administrator

The Arkansas Curriculum/Program Administrator Graduate Certificate requires 15 graduate credit hours beyond an earned master's degree. To receive the graduate certificate in Arkansas Curriculum/Program Administrator, candidates are required to have a valid teaching license. The program of study includes 15 credit hours in a specialization that has not been covered by the candidate's previously earned master's degree.

Students will select between one of the three specialization areas listed below. Students are strongly encouraged to meet with an adviser to review their course history and determine the option that will help them meet licensure requirements. The successful completion of the Arkansas Curriculum/Program Administrator Certificate will lead to a specialization endorsement in either Special Education Administration or Curriculum and Instruction Administration to be added to the candidate's existing professional educator's license.

Curriculum and Instruction Specialization (15 hours)

CIED 5363	Teaching in K-12 Online and Blended Classrooms	3
CIED 5423	Curriculum and Instruction: Models and Implementation	3
CIED 5983	Practicum in Curriculum & Instruction	3
CIED 6013	Curriculum Theory, Development, and Evaluation	3
CIED 6053	Curriculum and Instruction: Learner Assessment and Program Evaluation	3
Total Hours		15

Special Education Specialization (15 hours)

SPED 532V	Practicum in Special Education	3
SPED 5733	Inclusive Practices for Diverse Populations	3
SPED 5783	Professional and Family Partnerships	3
SPED 5893	Organization, Administration and Supervision of Special Education	3
SPED 6433	Legal Aspects of Special Education	3
Total Hours		15

Educational Leadership Specialization (15 hours)

EDLE 5013	School Organization and Administration	3
EDLE 5043	Leadership Ethics	3
EDLE 5063	Instructional Leadership, Planning, and Supervision	3
EDLE 5083	Analytical Decision-Making	3
EDLE 5093	Effective Leadership for School Improvement	3
Total Hours		15

Autism Spectrum Disorders (AUTS)

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Program Coordinator
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Graduate Certificate Offered:

Autism Spectrum Disorders (non-degree): AUTS

Graduate Certificate Program in Autism Spectrum Disorders (AUTS):

The graduate certificate in Autism Spectrum Disorders develops professionals in the area of autism spectrum disorders. The program recognizes students who take a concentrated core of courses focused on autism spectrum disorders. Students who earn the certificate develop knowledge and skills in the areas of characteristics, assessment, and educational interventions for individuals with autism spectrum disorders.

Admission requirements for the Graduate Certificate program include:

- A minimum of a 3.0 cumulative grade point average (GPA) during the last 60 hours of undergraduate work.

Program of Study:

SPED 5143	Teaching Communication Skills to Persons with Autism	3
SPED 6803	Teaching Students with Autism Spectrum Disorders	3
SPED 6813	Characteristics and Assessment of Persons with ASD	3

SPED 6823	Instructional Methods for Students with Autism Spectrum Disorders	3
SPED 6833	Practicum in Autism Spectrum Disorders	3

Building-Level Administration (PSBL)

Ed Bengtson
Head, Department of Curriculum and Instruction
Program Coordinator
206 Peabody Hall
479-575-5111
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Prerequisites for Acceptance to the Graduate Certificate Program in Building-Level Administration: Applicants must meet university requirements for admission to the Graduate School as non-degree-seeking, but certificate-seeking students, and must have a master's degree. In addition, to receive the graduate certificate in district-level administration, applicants must have a valid teaching license and a valid building-level administration license.

Requirements for the Building-Level Administration Certificate

EDLE 5013	School Organization and Administration	3
EDLE 5023	The School Principalship	3
EDLE 5043	Leadership Ethics	3
EDLE 5053	School Law	3
EDLE 5063	Instructional Leadership, Planning, and Supervision	3
EDLE 5083	Analytical Decision-Making	3
EDLE 5093	Effective Leadership for School Improvement	3
EDLE 574V	Internship	3
Total Hours		24

Certificate in Business Law

The School of Law business law certificate is designed for those students wishing to focus on business or transactional law to prepare themselves for a business law practice or to enhance their career prospects in the business field in general. The program provides a strong framework in the fundamentals of business and transactional law and skills through coursework and related activities. The program will prepare qualified J.D. degree and post-J.D. candidates for a wide variety of business and transactional law practices and, for non-law students, it will help provide a strong foundation for legal aspects of the business environment.

Admission requirements: The student must satisfy one of the following requirements:

1. Be currently enrolled in the J.D. program at the School of Law or be admitted as a visiting J.D. student at the School of Law;
2. Hold a J.D. degree from an accredited law school;
3. Be enrolled in the LL.M. program at the School of Law; or
4. Be admitted by the Associate Dean or that dean's designee (here in after the 'Associate Dean') as otherwise qualified to complete the certificate requirements successfully. The Associate Dean may limit the number of students eligible to pursue the certificate at any one time.

Course requirements:

The certificate program in Business Law requires 18 hours of coursework.

Foundational Business Law Courses

It is assumed that all students seeking the certificate will enter the program having already successfully completed, as part of their J.D. degree program or other qualifying studies, the following foundational business law courses (or equivalent):

LAWW 4024	Contracts
LAWW 4294	Business Organizations
LAWW 6233	Federal Income Tax of Individuals

Required Course Categories

In addition to completing all Foundational Business Law Courses, in order to be eligible for the Business Law Certificate a student must successfully complete at least 18 credit hours of business law coursework, including at least one course from each of the following three categories:

(ULW-approved three courses are Business Drafting, Contract Drafting, and Corporate Practice.)

Business Drafting Courses:

LAWW 406V	Upper Level Writing
LAWW 4182	Upper Level Writing - Business Drafting

Experiential Learning Business Courses:

LAWW 5213	Business Lawyering Skills
LAWW 686V	Corporate Counsel Externships

Public Company Courses:

LAWW 5662	Mergers and Acquisitions
LAWW 629V	Public Corporations
LAWW 536V	Securities Regulation

Business Electives

The following courses will count toward the 18 credit hours of business law coursework needed to complete the Business Law Certificate:

LAWW 6133	Antitrust Law	3
LAWW 6253	Federal Income Taxation of Business Entities	3
LAWW 5391	Effective Corporate Compliance	1
LAWW 6393	Legal Clinic: Nonprofit	3
LAWW 5543	International Business Transactions	3
LAWW 567V	Nonprofit Organizations	2-3
LAWW 500V	Special Topics	1-18

Special Topics LAWW 500V Corporate Counsel Colloquium, Corporate Finance, and Representing Startups. Any courses listed in the Experiential Business, Business Drafting, or Public Company Course categories listed above.

Extracurricular Course of Study

Students must attend at least 250 minutes of extracurricular programming sponsored by the business law society or approved in advance by the Associate Dean.

Substitutions

The Associate Dean may designate a Special Topics or other course as a qualifying Business Elective, and in rare cases, with substantial justification, may allow substitution in the Experiential Business, Business Drafting, or Public Company course categories listed above.

Other requirements:

J.D. candidates

Our J.D. students must declare their intention to complete the program before the final semester of their J.D. studies by notifying the Associate Dean. The student must have a cumulative law school GPA of at least 2.75 and a GPA of 3.0 or above in certificate courses at the time he or she declares. In order to receive the certificate upon graduation, the student must successfully complete the required courses, earn a GPA of at least 3.2 in certificate courses, and have a cumulative GPA of 2.75 or above.

J.D. visitors

Those currently earning a J.D. at another ABA accredited law school but visiting here may earn the business law certificate. They must apply to the Associate Dean before their final semester of J.D. studies. These students can satisfy certificate course credits with courses taken at their own law school, but must take at least 12 credits in certificate courses here, and they must complete the corporate counsel externship program or other approved experiential capstone course here.

A visiting J.D. student must have a cumulative law school GPA of at least 2.75 and a GPA of 3.0 or above in certificate courses at the time he or she applies for the certificate program. In order to receive the certificate upon graduation, the student must successfully complete the required courses and earn a GPA of 3.2 or above in certificate courses, and have a cumulative GPA of 2.75 or above.

Post-J.D. candidates

Those who have already earned a J.D. degree from an accredited law school in the United States may also earn a certificate. They must apply to the Associate Dean before commencing the program.

For the purposes of this program, post-J.D. candidates can determine their GPA within the program based in part on courses completed elsewhere. All post-J.D. candidates must fulfill the requirements listed in §5-1505 of the Faculty Policies Manual, at least 12 credits of which must be taken here, and they must complete the corporate counsel externship program or other approved experiential capstone course here.

Post-J.D. candidates must have a cumulative GPA of at least 3.0 from the school that conferred their law degree. To complete the program, they must earn a GPA of 3.2 or above in certificate courses.

LL.M. candidates

Our LL.M. candidates must notify the Associate Dean one month before enrollment in the LL.M. program of their intention to complete the program and must have the approval of the director of the LL.M. program.

For the purposes of this program, LL.M. candidates can determine their GPA within the program based in part on courses completed elsewhere. LL.M. candidates must satisfy all the required courses, at least 12 credits of which must be taken here, and must take the corporate counsel externship or other approved experiential capstone course here.

To declare, an LL.M. candidate must have a cumulative GPA of at least 3.0 from the school that conferred their law degree. To complete the program, they must earn a GPA of at least 3.2 in certificate courses and have a cumulative GPA of 2.75 or above.

General Requirements (Non-J.D./Non-LL.M. Candidates)

Post-baccalaureate students who are not enrolled as J.D. or LL.M. students at the law school (and do not have a J.D. degree) may also earn

a certificate. They must apply to the Associate Dean before commencing the program. If they have taken at least 12 credits of the required certificate courses at another ABA-accredited law school, their GPA in those courses must be at least 3.0 to apply. If they have not, their undergraduate cumulative GPA must be at least 3.5. For the purposes of this program, these students can determine their GPA within the program based in part on courses completed elsewhere.

To earn the certificate, these students must complete all the required courses, at least 12 credits of which must be taken here, and they must complete the approved experiential capstone course here. To complete the program, they must also earn a GPA of 3.2 or above in certificate courses.

Learning Objectives

Students who successfully complete the requirements for the Business Law Certificate will:

1. Demonstrate proficiency in explaining and analyzing the legal and regulatory implications of common business matters
2. Be able to draft documents relevant to typical business formations and basic transactions and
3. Demonstrate an understanding of the role of counsel to businesses, business owners, or business management, as well as an appreciation of the ethical implications of representing each discrete group.

Certificate in Criminal Law

The Law School offers a criminal law certificate to those students wishing to focus on criminal law during law school and prepare themselves for the practice of criminal law or policy. The program is available to J.D. candidates, LL.M. candidates, as well as other post-baccalaureate students as described below. The program requires students to develop litigation skills through at least one criminal law clinic (or other experiential capstone course approved as a substitute by the Associate Dean for Academic Affairs or that dean's designee), as well as skills courses while also providing a strong framework in the fundamentals of criminal law and procedure through coursework.

Many law schools and employers continue to seek ways to better prepare students for the practice of law immediately upon graduation, and this certificate seeks to make its graduates far more prepared to step into criminal law practice, whether at public agencies such as prosecution or public defender offices, or at firms or even in solo practice. The program seeks, through minimum requirements, to ensure qualified candidates graduate ready for a practice in criminal law. For non-law students, it will help provide a strong foundation for policy work or other criminal justice fields.

Admission requirements: The student must satisfy one of the following requirements:

1. Be currently enrolled in the J.D. program at the School of Law or be admitted as a visiting J.D. student at the School of Law.
2. Hold a J.D. degree from an accredited law school.
3. Be enrolled in the LL.M. program at the U of A School of Law.
4. Be admitted by the associate dean for academic affairs or that dean's designee as otherwise qualified to complete the certificate requirements successfully.

The associate dean for academic affairs, or designee, may limit the number of students eligible to pursue the certificate at any one time.

Course Requirements for the Certificate in Criminal Law

Students seeking the certificate generally will enter the program having already successfully completed as part of their J.D. degree program or other qualifying studies, the following basic law courses (or equivalents): LAWW 4074 Criminal Law (Irregular); LAWW 4173 Criminal Procedure I (Irregular); LAWW 6093 Basic Evidence (Irregular); and LAWW 5013 Professional Responsibility (Irregular). Students who have not already completed one or more of these courses before entering the program may, however, do so during the time they are also pursuing the certificate.

Required Courses

LAWW 6203	Trial Advocacy	3
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Electives

Select four of the following (at least three must be non-externships)

LAWW 6633	Criminal Procedure: Adjudication	3
LAWW 6413	Legal Clinic: Advanced Criminal Practice	3
LAWW 4233	Upper Level Writing: Crime and the Supreme Court	3
LAWW 500V	Special Topics (Federal Criminal Law)	3
LAWW 5643	International Criminal Law	3
LAWW 4212	Upper Level Writing: Police Discretion	2
LAWW 500V	Special Topics (Prisoners' Rights Seminar)	2
Externships		
LAWW 673V	Criminal Defense Externship	1-3
LAWW 683V	Criminal Prosecution Externship	1-3

Other requirements:

J.D. Candidates: Our J.D. students must declare their intention to complete the program in the spring of their 2L year by notifying the Associate Dean.

The student must have a cumulative law school GPA of at least 2.75 and a GPA of 3.0 or above in certificate courses at the time the student declares. In order to receive the certificate upon graduation, the student must fulfill the requirements in §5-1408 in the Faculty Policies Manual, earn a GPA of 3.2 or above in certificate courses (including Criminal Certificate prerequisites), a cumulative GPA of at least 2.75, and a B+ or above in the criminal practice clinic, or other approved experiential capstone course (if graded).

J.D. Visitors: Those currently earning a J.D. at another ABA-accredited law school but visiting here may earn the criminal law certificate. They must apply to the Associate Dean by spring of their 2L year. These students can satisfy certificate course credits with courses taken at their own law school, but must take at least 12 credits in certificate courses here. Also, they must complete the criminal clinic program or other approved experiential capstone course here.

The student must have a cumulative law school GPA of at least 2.75 and a GPA of 3.0 or above in certificate courses at the time the student applies. In order to receive the certificate upon graduation, the student must fulfill the requirements in §5-1408 in the Faculty Policies Manual, earn a GPA of at least 3.2 in certificate courses (including Criminal Certificate prerequisites), and a B+ or above in the criminal practice clinic or other approved experiential capstone course (if graded).

Post-J.D. Candidates: Those who have already earned a J.D. degree from an accredited law school in the United States may also earn a certificate. They must apply to the Associate Dean before commencing the program.

For the purposes of this program, post-J.D. candidates can determine their GPA within the program based in part on courses completed elsewhere. All post-J.D. candidates must fulfill the requirements in §5-1408 in the Faculty Policies Manual, at least 12 credits of which must be taken here, and they must complete or have completed the criminal clinic program or other approved experiential capstone course.

Post-J.D. candidates must have at least a cumulative GPA of 3.0 from the school that conferred their law degree. To complete the program, they must earn a GPA of 3.2 or above in certificate courses (including Criminal Certificate prerequisites) and a B+ or above in the criminal practice clinic or other approved experiential capstone course (if graded).

LL.M. Candidates: Our LL.M. candidates must notify the Associate Dean no later than one month before enrollment in the LL.M. program of their intention to complete the program and must have the approval of the director of the LL.M. program.

For the purposes of this program, LL.M. candidates can determine their GPA within the program based in part on courses completed elsewhere. LL.M. candidates must satisfy all the requirements in §5-1408 in the Faculty Policies Manual, at least 12 credits of which must be taken here, and must take the criminal practice clinic or other approved experiential capstone course here.

To declare, an LL.M. candidate must have at least a cumulative GPA of 3.0 from the school that conferred their law degree. To complete the program, they must earn a GPA of 3.2 in certificate courses (including Criminal Certificate prerequisites), a cumulative GPA of at least 2.75, and a B+ or above in the criminal practice clinic or other approved experiential capstone course (if graded).

General Requirements (Non-J.D. and Non-LL.M. Candidates): Post-baccalaureate students who are not enrolled as J.D. or LL.M. students at the law school (and do not have a J.D. degree) may also earn a certificate. They must apply to the Associate Dean before commencing the program. If they have taken at least 12 credits of the required certificate courses listed in §5-1408 in the Faculty Policies Manual at another ABA accredited law school, their GPA in those courses must be at least 3.0 to apply. If they have not, their undergraduate cumulative GPA must be at least 3.5. For the purposes of this program, these students can determine their GPA within the program based in part on courses completed elsewhere.

To earn the certificate, these students must complete all the coursework as set forth in §5-1408 in the Faculty Policies Manual, at least 12 credits of which must be taken here, and they must complete the approved experiential capstone course here. To complete the program, they must also earn a GPA of at least 3.2 in certificate courses (including Criminal Certificate prerequisites) and a B+ or above in the approved experiential capstone course (if graded).

Certificate; Substitute Courses; Enrollment Limit: Each student completing the requirements will receive a certificate. If appropriate, the Associate Dean may approve any new electives proposed to satisfy the elective requirements of the program. The Associate Dean may limit the number of students eligible to pursue the certificate at any one time.

Cross-Sector Alliances (CSAL)

Margaret Reid
Program Coordinator
Old Main 428
479-575-5352
Email: m (pkford@uark.edu)reid@uark.edu

Cross Sector Alliances Web Page (<http://grad.uark.edu/crossSectorAlliance/>)

Graduate Certificate Offered:

Cross-Sector Alliances (non-degree) (CSAL)

Program Description: A Graduate Certificate in Cross-Sector Alliances is offered collaboratively by the Master of Public Administration program in the Fulbright College of Arts and Sciences and the Master of Business Administration program in the Walton College of Business. The program prepares students for a workplace in which they will be interacting with organizations from other sectors in joint projects or initiatives. Accordingly, students must understand the financial, accountability and general management challenges of the different sectors. In addition, the program also prepares students for work in different sectors and builds skills not addressed in stand-alone programs. In general, students will gain a fundamental knowledge of within-sector management issues, how those issues relate to cross-sector management and governance, and will be able to apply this understanding in practical scenarios.

Admission Requirements: Admission to the Graduate School.

Requirements for a Graduate Certificate in Cross-Sector Alliances

The graduate certification Cross-Sector Alliances requires satisfactory completion of 15 hours of coursework:

Students must register with the Graduate School separately from their chosen degrees.

PLSC 5133	Nonprofit Management	3
Choose one:		3
PLSC 5193	Seminar in Public Administration (for M.B.A. students)	
MGMT 5223	Business Leadership and Ethics (for M.P.A. students)	
MGMT 5313	Strategic Management	3
WCOB 5843	Cross-Sector Collaboration for Sustainability	3

Electives

Choose one of the following:		3
PADM 5823	Grant Writing for the Social Sciences	
PADM 5813	Managing Information Technologies in Public Affairs	
PLSC 5173	Community Development	
MGMT 4103	Special Topics in Management	
WCOB 510V	Special Topics in Business	

Cybersecurity (CYBR)

Xiaoqing Liu
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Program Director
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Program Description: The Cybersecurity Graduate Certificate prepares students to protect valuable data assets and develop cyber-centric multidisciplinary security skills for predicting and avoiding cyber threats.

Program Requirements: Students are required to take 12 hours of coursework to complete the Cybersecurity Graduate Certificate.

Required Course

CSCE 5323	Computer Security	3
Choose 9 hours from the following courses:		9
CSCE 5333	Computer Forensics	
CSCE 5433	Advanced Cryptography	
CSCE 5623	Secure Digital System Design	
CSCE 5653	Network Security	
CSCE 5663	Database Security	
CSCE 5753	Wireless Systems Security	
CSCE 5763	Privacy Enhancing Technologies	
CSCE 5833	Computer Architecture Security	
Total Hours		12

District-Level Administration (PSDL)

Ed Bengtson
Head, Department of Curriculum and Instruction
Program Coordinator
101 Peabody Hall
479-575-5111
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Graduate Certificate Offered:

District-Level Administration (non-degree) (PSDL)

Prerequisites for Acceptance to the Graduate Certificate Program in District-Level Administration: Applicants must meet university requirements for admission to the Graduate School as non-degree-seeking, but certificate-seeking students, and must have a master's degree. In addition, to receive the graduate certificate in district-level administration, applicants must have a valid teaching license and a valid building-level administration license.

Requirements for the District-Level Administration Certificate

EDLE 6023	School Facilities Planning and Management	3
EDLE 6053	School-Community Relations	3
EDLE 6093	School District Governance: The Superintendency	3
EDLE 6103	School Finance	3
EDLE 6173	School Business Management	3
EDLE 674V	Internship	3
Total Hours		18

If the certificate candidate is an experienced and practicing administrator at another administrative licensure level, the six required courses may be reduced by one course for a total of 15 hours past prerequisites. All certificate programs of study courses must be completed within five years before submission to the Arkansas Department of Education.

Educational Psychology (EDPS)

Michael Hevel
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<http://esrm.uark.edu>

Graduate Certificate Offered:

Educational Psychology (non-degree) (EDPS)

Program Description: The Educational Statistics and Research Methods program develops professionals in the areas of educational research methods and policy studies, both through courses and Independent research. Graduates can obtain employment with school districts, educational agencies, and industries with internal data analysis needs.

Graduate Certificates

Admission to the Graduate Certificate Programs: In addition to meeting University requirements for admission to the Graduate School, applicants must have earned a master's degree with a 3.25 cumulative GPA and minimum scores on the Graduate Record Examinations at the 48th percentile Verbal, the 56th percentile Quantitative and the 29th percentile on Analytic Writing OR be currently enrolled in a doctoral program at the University of Arkansas.

Certificate Requirements: Required list of courses for a certificate with a grade-point average of 3.50.

Graduate Certificate in Educational Psychology:

The graduate certificate in Educational Psychology recognizes students who take a concentrated core of courses focused on educational psychology. Students who earn this certificate develop a foundational understanding of educational psychology theories, application of theory to educational practices and evaluation, and methods for identifying issues that arise in the learning process for learners of all ages.

Program Of Study

EDFD 5573	Life-Span Human Development	3
EDFD 5373	Psychological Foundations of Teaching and Learning	3
EDFD 5673		
EDFD 5773		
Select one of the following:		3
ESRM 5013	Research Methods in Education	
ESRM 5393	Statistics in Education and Health Professions	

ESRM 6403 Educational Statistics and Data Processing

Total Hours

9

Other relevant graduate coursework will be allowed on a case-by-case basis, subject to Educational Statistics and Research Methods program faculty approval and topical relevancy to the graduate certificate and its aims.

Educational Statistics and Research Methods (ESRM)

Michael Hevel
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479-575-4924
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Wen-juo Lo
Program Coordinator
100 Graduate Education Building
479-575-6321
Email: wlo@uark.edu

Educational Statistics and Research Methods website (<http://esrm.uark.edu>)

Degrees Conferred:

Ph.D. in Educational Statistics and Research Methods (ESRM)

Graduate Certificates Offered (non-degree):

Educational Psychology (EDPS)
Educational Statistics and Research Methods (EDST)

Program Description: The Educational Statistics and Research Methods program develops professionals in the areas of educational research methods and policy studies, both through courses and Independent research. Graduates can obtain employment with school districts, educational agencies, and industries with internal data analysis needs.

Graduate Certificates

Admission to the Graduate Certificate Programs: In addition to meeting University requirements for admission to the Graduate School, applicants must have earned a master's degree with a 3.25 cumulative GPA and minimum scores on the Graduate Record Examinations at the 48th percentile Verbal, the 56th percentile Quantitative and the 29th percentile on Analytic Writing OR be currently enrolled in a doctoral program at the University of Arkansas.

Certificate Requirements: Required list of courses for a certificate with a grade-point average of 3.50.

Doctor of Philosophy

Doctor of Philosophy in Educational Statistics and Research

Methods: The increased emphasis on educational accountability and data-driven decision making to improve public school institutions, as well as greater reliance on empirical research and analysis in public policy and educational studies, have led to a greater need for experts in educational statistics and research methods. The Educational Statistics and Research Methods doctoral program develops professionals who can lead in these areas through coursework and independent research in educational statistics, research design, assessment, and program evaluation.

Requirements for Ph.D. in Educational Statistics and Research Methods

Admission Requirements for the Ph.D. Degree: In addition to meeting University requirements for admission to the Graduate School, applicants should have an earned master's degree with a minimum 3.25 GPA and scores on the Graduate Record Examinations at the 48th percentile Verbal, the 65th percentile Quantitative and the 48th percentile on Analytic Writing. Higher performance on the quantitative component of the GRE may compensate for a lower GPA in admissions decisions.

Requirements for the Ph.D. Degree: Students must complete all requirements of the Graduate School for the Doctor of Philosophy degree, and complete an approved program of study including a minimum of 36 credit hours of core courses, 9 hours of elective courses, and 18 credit hours of doctoral dissertation. Coursework must be completed with a cumulative grade average of at least 3.25, with no credit for courses with a grade of "C" or lower.

EDFD 5373	Psychological Foundations of Teaching and Learning	3
EDFD 5683	Issues in Educational Policy	3
ESRM 6403	Educational Statistics and Data Processing	3
ESRM 6413	Experimental Design in Education	3
ESRM 6423	Multiple Regression Techniques for Education	3
ESRM 6453	Applied Multivariate Statistics	3
ESRM 6513	Hierarchical Linear Modeling	3
ESRM 6523	Structural Equation Modeling	3
ESRM 6533	Qualitative Research	3
ESRM 6553	Advanced Multivariate Statistics	3
ESRM 6613	Evaluation of Policies, Programs, and Projects	3
ESRM 6653	Measurement and Evaluation	3
Select the following:		9
ESRM 5653	Educational Assessment	
ESRM 6753	Item Response Theory	
ESRM 699V	Seminar	
ESRM 700V	Doctoral Dissertation	18
Total Hours		63

Students should also be aware of Graduate School requirements with regard to doctoral degrees (p. 456).

Graduate Certificate in Educational Psychology

Graduate Certificate in Educational Psychology:

The graduate certificate in Educational Psychology recognizes students who take a concentrated core of courses focused on educational psychology. Students who earn this certificate develop a foundational understanding of educational psychology theories, application of theory to educational practices and evaluation, and methods for identifying issues that arise in the learning process for learners of all ages.

Program Of Study

EDFD 5573	Life-Span Human Development	3
EDFD 5373	Psychological Foundations of Teaching and Learning	3
EDFD 5673		
EDFD 5773		

Select one of the following:		3
ESRM 5013	Research Methods in Education	
ESRM 5393	Statistics in Education and Health Professions	
ESRM 6403	Educational Statistics and Data Processing	
Total Hours		9

Other relevant graduate coursework will be allowed on a case-by-case basis, subject to Educational Statistics and Research Methods program faculty approval and topical relevancy to the graduate certificate and its aims.

Graduate Certificate in Educational Statistics and Research Methods

Graduate Certificate in Educational Statistics and Research Methods:

The graduate certificate in Educational Statistics and Research Methods recognizes students who complete a core of courses focused on developing theoretical, application, and interpretative aspects of statistical techniques and research methods. Graduate students completing this certificate will also develop comprehensive programming and data management skills necessary for today's academic researcher.

Program Of Study

ESRM 6403	Educational Statistics and Data Processing	3
ESRM 6413	Experimental Design in Education	3
ESRM 6423	Multiple Regression Techniques for Education	3
ESRM 6453	Applied Multivariate Statistics	3
Select one of the following:		3
ESRM 5653	Educational Assessment	
ESRM 6653	Measurement and Evaluation	
Select one of the following:		3
ESRM 6513	Hierarchical Linear Modeling	
ESRM 6523	Structural Equation Modeling	
ESRM 6553	Advanced Multivariate Statistics	
ESRM 699V	Seminar	
Total Hours		18

Educational Foundations Courses

EDFD 5373. Psychological Foundations of Teaching and Learning. 3 Hours.

Psychological principles and research applied to classroom learning and instruction. Social, emotional, and intellectual factors relevant to topics such as readiness, motivation, discipline, and evaluation in the classroom. (Typically offered: Irregular)

EDFD 5573. Life-Span Human Development. 3 Hours.

Basic principles of development throughout the human life-cycle. Physical, cognitive, social, emotional, and personality development. (Typically offered: Fall, Spring and Summer)

EDFD 5683. Issues in Educational Policy. 3 Hours.

This course examines how K-12 education policy is designed and implemented in the United States. Students will develop a working knowledge of policymaking frameworks to examine major education policies of current interest and debate key policy issues that arise at each level of government. (Typically offered: Fall, Spring and Summer)

This course is cross-listed with EDRE 6413.

Educational Statistics and Research Methods Courses

ESRM 5013. Research Methods in Education. 3 Hours.

General orientation course which considers the nature of research problems in education and the techniques used by investigators in solving those problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

ESRM 5393. Statistics in Education and Health Professions. 3 Hours.

Applied statistics course for Master's degree candidates. Includes concepts and operations for frequency distributions, graphing techniques, measures of central tendency and variation, sampling, hypothesis testing, and interpretation of statistical results. (Typically offered: Fall, Spring and Summer)

ESRM 5653. Educational Assessment. 3 Hours.

Introduction to measurement issues and basic test theory. Focus on types and usage of assessment tools, data management, and analysis and interpretation of educational data. Practical training in the utilization and interpretation of academic achievement data in Arkansas. (Typically offered: Irregular)

ESRM 599V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ESRM 605V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer)

ESRM 6403. Educational Statistics and Data Processing. 3 Hours.

Theory and application of frequency distributions, graphical methods, central tendency, variability, simple regression and correlation indexes, chi-square, sampling, and parameter estimation, and hypothesis testing. Use of the computer for the organization, reduction, and analysis of data (required of doctoral candidates). Prerequisite: ESRM 5013 or ESRM 5393 or an equivalent course, each with a grade of C or better. (Typically offered: Fall, Spring and Summer)

ESRM 6413. Experimental Design in Education. 3 Hours.

Principles of experimental design as applied to educational situations. Special emphasis on analysis of variance techniques used in educational research. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Spring)

ESRM 6423. Multiple Regression Techniques for Education. 3 Hours.

Introduction to multiple regression procedures for analyzing data as applied in educational settings, including multicollinearity, dummy variables, analysis of covariance, curvi-linear regression, and path analysis. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Fall)

ESRM 6453. Applied Multivariate Statistics. 3 Hours.

Multivariate statistical procedures as applied to educational research settings including discriminant analysis, principal components analysis, factor analysis, canonical correlation, and cluster analysis. Emphasis on use of existing computer statistical packages. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Spring)

ESRM 6513. Hierarchical Linear Modeling. 3 Hours.

This course covers the theory and applications of hierarchical linear modeling (HLM) also known as multilevel modeling. Both the conceptual and methodological issues for analyses of nested (clustered) data in using HLM will be reviewed, including linear models, non-linear models, growth models, and some alternative designs. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Fall Even Years)

ESRM 6523. Structural Equation Modeling. 3 Hours.

This course provides a detailed introduction to structural equation modeling (SEM) based on students' previous knowledge of multiple linear regression. Topics include path analysis, confirmatory factor analysis, full latent variable models, estimation techniques, data-model fit analysis, model comparison, and other topics, potentially equivalent models, specification searches, latent mean models, parameter invariance, multi-group models, and models of discrete data. Prerequisite: ESRM 6423 with a grade of C or better. (Typically offered: Spring)

ESRM 6533. Qualitative Research. 3 Hours.

Introduction of non-quantitative methods, including data collection through interviews, field observation, records research, internal and external validity problems in qualitative research. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall and Spring)

ESRM 6543. Advanced Qualitative Research. 3 Hours.

Preparation for the conduct of qualitative research, structuring, literature reviews, data collection and analysis, and reporting results. Prerequisite: ESRM 6533 with a grade of C or better. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

ESRM 6553. Advanced Multivariate Statistics. 3 Hours.

Builds on the foundation provided in Multivariate and introduces techniques that extend methodological elements of canonical, discriminant, factor analytic, and longitudinal analyses, providing the mathematical and theoretical foundations necessary for these designs. Prerequisite: ESRM 6453 with a grade of C or better. (Typically offered: Spring Even Years)

ESRM 6613. Evaluation of Policies, Programs, and Projects. 3 Hours.

Introduction to evaluation in social science research, including why and how evaluations of programs, projects, and policies are conducted; includes analysis of actual evaluations in a variety of disciplines. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)
This course is cross-listed with EDRE 6213.

ESRM 6653. Measurement and Evaluation. 3 Hours.

Fundamentals of measurement: scales, scores, norms, reliability, validity. Test and scale construction and item analysis. Standardized measures and program evaluation models in decision making. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)

ESRM 668V. Practicum in Research. 1-6 Hour.

Practical experience in educational research on campus, in school systems, or in other agencies in educational program development. (Typically offered: Irregular)

ESRM 6753. Item Response Theory. 3 Hours.

Topics of measurement in the psychometric field focusing on item response theory; item level and test level analyses including differential item functioning, test dimensionality, computer adaptive testing, equating, and general evaluation and usage of measurement instruments. Prerequisite: ESRM 6653 with a grade of C or better. (Typically offered: Spring Odd Years)

ESRM 699V. Seminar. 1-6 Hour.

Seminar. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Enterprise Systems (ENTS)

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Director
WCOB 215
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The Graduate Certificate in Enterprise Systems is a part-time program offered on campus, blended, and online. It is designed to provide graduate students with knowledge and experience in information systems used in modern enterprise environments. The demand for skilled professionals in information systems continues to outpace the supply of qualified applicants. Students may choose one of three concentrations for the Graduate Certificate in Enterprise Systems: Enterprise Information Systems, Business Analytics, or Enterprise Resource Planning. The certificate program is intended to be completed part-time (ordinarily no more than six hours per semester), and is open to individuals with backgrounds in any discipline.

Admission Requirements: The Graduate Certificate in Enterprise Systems is a part-time program open to individuals with backgrounds in any discipline. Students must apply and be admitted to the Graduate School of Business; the GMAT/GRE requirement is waived for the Graduate Certificate in Enterprise Systems degree program. (Students who have earned a GPA 3.5 or better upon completion of the certificate program and subsequently apply to the part-time Master of Information Systems program (Professional M.I.S.) will not be required to submit a test score). Information regarding Graduate School of Business admission requirements can be found earlier in this chapter.

Requirements for the Graduate Certificate in Enterprise Systems: (12 hours)

To receive the Graduate Certificate in Enterprise Systems, students must select one of the tracks below. Students are required to take 9 hours of coursework in the Walton College of Business and 3 hours of electives related to Enterprise Systems in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below must be approved by the director of the certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Required Course

Choose at least one of the following depending on the track chosen:

ISYS 5173	Blockchain Fundamentals
ISYS 5103	Data Analytics Fundamentals
ISYS 5213	ERP Fundamentals

Blockchain Enterprise Systems Track

This track is open to individuals with backgrounds in fields other than Information Systems and is designed to provide non-IS graduate students with the fundamental knowledge and skills needed to successfully transition to a career in the Information Systems field. Students who complete this track will have exposure to fundamental principles of blockchain, enterprise information systems, and techniques for management and development of blockchain projects.

Required Courses (9 hours)

ISYS 5173	Blockchain Fundamentals	3
ISYS 5133	Blockchain and E Business Development	3
ISYS 5453	Blockchain and Enterprise Data	3

Students should choose 3 hours of coursework from among the following:

ISYS 5103	Data Analytics Fundamentals (recommended)
ISYS 5213	ERP Fundamentals
ISYS 5463	Enterprise Transaction Systems

ISYS 5833 Data Management Systems

Total Hours	12
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Business Analytics Track

This track is open to individuals with backgrounds in any discipline and is designed to give business and non-business graduate student's knowledge and experience in the management and use of enterprise data for operations and decision-making. The ability to effectively manage and analyze increasingly large and complex sets of data is highly valued among employers in all disciplines, as "business intelligence" becomes a primary source of competitive advantage in many organizations. Students who complete this track will have a foundation in the effective management and use of relational and dimensional data, the application of statistical decision-making theory, and the exploration and exploitation of data using advanced data mining tools and techniques. Students completing this track may be eligible to receive a certificate endorsed by the SAS Institute.

Required Courses (9 hours)

ISYS 5103	Data Analytics Fundamentals	3
ISYS 5503	Decision Support and Analytics	3
ISYS 5843	Seminar in Business Intelligence and Knowledge Management	3

Students should choose 3 hours of coursework from among the following:

ISYS 511V	IT Toolkit & Skills Seminar (this course may not be used for the Masters of Information Systems Degree)
ISYS 5133	Blockchain and E Business Development
ISYS 5213	ERP Fundamentals
ISYS 5423	Seminar in Systems Development
ISYS 5833	Data Management Systems

Total Hours	12
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Enterprise Resource Planning Track

This track is open to individuals with backgrounds in any discipline and is designed to provide business and non-business graduate students a foundation in the effective use, implementation, and customization of Enterprise Resource Planning (ERP) systems. ERP systems support integrated core business processes in nearly every large organization, and knowledge of and experience with these systems are highly valued among employers in all business disciplines. Students who complete this track will have exposure to fundamental principles of ERP and techniques for configuration, implementation, and development of ERP systems. Students completing this track may be eligible to receive a certificate endorsed by SAP America and the SAP University Alliances Program.

Required Courses (9 hours)

ISYS 5213	ERP Fundamentals	3
ISYS 5223	ERP Configuration and Implementation	3
ISYS 5233	Seminar in ERP Development	3

Students should choose 3 hours of coursework from among the following:

ISYS 511V	IT Toolkit & Skills Seminar (recommended)
ISYS 5103	Data Analytics Fundamentals
ISYS 5173	Blockchain Fundamentals
ISYS 5453	Blockchain and Enterprise Data

ISYS 5833	Data Management Systems	
Total Hours		12

Entrepreneurship (ENTR)

Anne O'Leary-Kelly
Associate Dean for Research and Graduate Programs
328 Walton College of Business
479-575-2851

Admission Requirements: The Graduate Certificate in Entrepreneurship is open to all graduate students who are in good standing with the graduate school at their campus. Students must apply and be admitted to the Graduate School of Business. Information regarding Graduate School of Business admission requirements can be found earlier in this chapter.

Requirements for the Graduate Certificate in Entrepreneurship: (12 hours) To receive the Graduate Certificate in Entrepreneurship, students are required to take 9 hours of coursework in the Walton College of Business and 3 hours of electives related to entrepreneurship in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below may be approved by the Director of the Certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Required Courses

Choose one of the following: 3

MGMT 5213	Business Foundations for Entrepreneurs (for non-Business students only)	
MGMT 5313	Strategic Management (required for Business students)	
MGMT 5323	New Venture Development	3
MGMT 5413	New Venture Development II	3

Elective Course

Select one of the following: 3

Dale Bumpers College of Agricultural, Food, and Life Sciences

AGEC 5143	Financial Management in Agriculture	
AGEC 5413	Agribusiness Strategy	
HDFS 5463	Administration and Leadership in the Helping Professions	

J. William Fulbright College of Arts & Sciences

ARTS 596V	Fine Arts Gallery Internship	
GDES 594V	Graphic Design Internship	
COMM 5403	Organizational Communication Theory	
JOUR 5063	Issues in Advertising and Public Relations	
JOUR 5323	Documentary Production I	

Walton College of Business

MBAD 535V	MBA Internship	
MGMT 5993	Entrepreneurship Practicum	
MGMT 5363	Innovation & Creativity	
MKTG 5433	Consumer and Market Research	
MKTG 5553	New Product Development and Strategy	

College of Education and Health Professions

RESM 5463	Sports Facilities Management	
ATTR 5473	Administration in Athletic Training	

RESM 5843	Tourism	
College of Engineering		
INEG 5453	Systems Engineering and Management	
INEG 5463	Project Management	
INEG 5623	Analysis of Inventory Systems	
Graduate School		
MSEN 5383	Research Commercialization and Product Development	
MSEN 5821	Ethics for Scientists and Engineers	
Total Hours		12

Geospatial Technologies (GIST)

Christopher L. Liner
Department Chair, Geosciences
216 Gearhart Hall
479-575-3355
Email: liner@uark.edu

Jason Tullis
Program Coordinator
216 Gearhart Hall
479-575-8784
Email: jatullis@uark.edu

Graduate Certificate Offered:

Geospatial Technologies (non-degree) (GIST)

The Department of Geosciences offers an online Geospatial Technologies Graduate Certificate through University of Arkansas Global Campus (<http://globalcampus.uark.edu/>). This certificate is designed for working professionals who wish to develop technical skills in the emerging field of geospatial technologies. The certificate provides the technical instruction needed to be employed in the geosciences and collateral disciplines as one of the American Society of Photogrammetry and Remote Sensing's "Mapping Scientist" and as a "Certified Geographic Information Systems Professional" (GISP).

Requirements for a Geospatial Technologies Graduate Certificate

Requirements for admission: Graduate status; there are no disciplinary requirements.

A total of 12-18 hours are required for the certificate:

GEOS 5043	Foundations of Geospatial Data Analysis	3
GEOS 5073	Geospatial Technologies Computational Toolkit	3
GEOS 5083	Geospatial Data Mining	3
GEOS 5543	Geospatial Applications and Information Science	3
GEOS 5553	Spatial Analysis Using ArcGIS	3
GEOS 5593	Introduction to Geodatabases	3

It is possible to waive 3 to 6 hours of required coursework for GEOS 5043 and GEOS 5073 through successful completion of proficiency exams.

Homeland Security (OMHS)

Gregory S. Parnell
Program Director
311 White Hall
479-575-3413

Email: msom@uark.edu

Graduate Certificate Offered:

Homeland Security (non-degree) (OMHSGC)

Requirements for Graduate Certificate in Homeland Security

Program admission requires 3.0 GPA on the last 60 hours of undergraduate coursework. Students must complete coursework with at least a 3.0 GPA. Four courses totaling 12 credit hours must be completed. The following courses are required core courses:

OMGT 5003	Introduction to Operations Management	3
OMGT 5013	Supply Chain Management for Operations Managers	3
OMGT 5993	Homeland Security for Operations Managers	3
Complete one of the following:		3
OMGT 5373	Quality Management	
OMGT 5423	Operations Management & Global Competition	
OMGT 5623	Strategic Management	
OMGT 5733	Human Behavior Analysis	
OMGT 5793	Risk Management	
OMGT 5823	Information Technology for Operations Managers	
OMGT 5903	Operations Management of Unmanned Aircraft Systems	
Total Hours		12

K-12 Online Teaching

Ed Bengtson

Department Head, Curriculum and Instruction

Program Coordinator

101 Peabody Hall

479-575-5111

Email: e (cmurphy@uark.edu)gbengts@uark.edu

Graduate Certificate Offered:

K-12 Online Teaching (non-degree)

Admission Requirements for the Graduate Certificate:

Applicants must meet university requirements for admission to the Graduate School as a non-degree seeking, but certificate-seeking student as well as application requirements of the Educational Technology graduate program, which includes:

- A completed bachelor's degree at an accredited institution
- An earned 3.00 GPA on the last 60 hours of undergraduate course work
- A completed Application for Admission to the Certificate Program in K-12 Online Teaching, which is available on the Educational Technology admissions web page (<http://etec.uark.edu/admission/>).

Certificate Course Requirements (15 hrs):

EETC 5213	Designing Educational Media	3
EETC 6253	Teaching and Learning at a Distance	3
EETC 5243	Designing Technology Based Instruction: Theories and Models	3
CIED 5363	Teaching in K-12 Online and Blended Classrooms	3

CIED 5423	Curriculum and Instruction: Models and Implementation	3
Total Hours		15

Courses from other institutions or academic programs may not be substituted for the required courses. Candidates for the Graduate Certificate must have a 3.0 or better at the conclusion of all course work to successfully complete the certificate requirements.

Lean Sigma Six (OMLS)

Gregory S. Parnell

Program Director

311 White Hall

479-575-3413

Email: msom@uark.edu

Graduate Certificate Offered:

Lean Six Sigma (non-degree) (OMLSGC)

Requirements for the Graduate Certificate in Lean Six Sigma:

Program admission requires 3.0 GPA on the last 60 hours of undergraduate coursework. Students must complete the following 12 hours of coursework with at least a 3.0 GPA.

Required Courses

OMGT 5373	Quality Management	3
OMGT 5473	Lean Six Sigma	3
OMGT 5493	Advanced Lean Six Sigma	3
OMGT 5783	Project Management for Operations Managers	3
Total Hours		12

Music Education for Special Needs Students (MESN)

Ronda Mains

Department Chair, Music

201 Music Building

479-575-4701

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Er-Gene Kahng

Graduate Coordinator

201 Music Building

479-575-6270

Email: ekahng@uark.edu

The Graduate Certificate in Music Education for Special Needs Students is designed for teachers who have an interest in working with students identified under the Individuals With Disabilities Act as needing accommodations, modifications, or adaptations in order to succeed in the music classroom. Coursework will focus on understanding behavior and learning characteristics of these diverse learners, creating and adapting lesson plans with appropriate modifications, adaptations, and accommodations, and using music to work with the families and communities of the special needs students in the music classroom.

Requirements for the Graduate Certificate in Music Education for Special Needs Students: The graduate certificate requires 15 hours of coursework in one of the following semester sequences:

One-Year Plan

Fall Semester		
MUED 5743	Characteristics of Special Needs Students in the Music Classroom	3
SPED 5733	Inclusive Practices for Diverse Populations	3
Spring Semester		
MUED 5753	Teaching Music to Students with Special Needs	3
MUED 5763	Practicum in Teaching Music to Students with Special Needs	3
SPED 5783	Professional and Family Partnerships	3
Total Hours		15

Two-Year Plan

Fall Semester 1		
MUED 5743	Characteristics of Special Needs Students in the Music Classroom	3
Spring Semester 1		
SPED 5783	Professional and Family Partnerships	3
Fall Semester 2		
SPED 5733	Inclusive Practices for Diverse Populations	3
Spring Semester 2		
MUED 5753	Teaching Music to Students with Special Needs	3
MUED 5763	Practicum in Teaching Music to Students with Special Needs	3
Total Hours		15

Nursing Education (NUED)

Susan Patton
 Director, Eleanor Mann School of Nursing
 Epley Center for Health Professionals 110
 479-575-3904
 Email: skpatton@uark.edu

Graduate Certificate Offered:
 Nursing Education (non degree) (NUED)

Program Description: This Graduate Certificate in Nursing Education program will prepare the next generation of nurse educators for the role in academic settings. Students augment their existing Master's preparation in the clinical setting with knowledge and skills to function as qualified nursing educators ready for the demands of the academic setting. The students completing this certificate fill the needs of nursing education programs across the country at all levels. The program is offered 100% online.

Program Requirements: The semester of entry can be spring, summer, or fall. The courses listed below must be completed. The NURS 5343 Specialty Development I (Teaching Practicum) course will be the last course in the sequence. Students opting to enroll beginning fall or summer will be required to take only NURS 5073 in the fall (not NURS 5343) followed by one course each semester with completion the following fall. Students entering in spring will complete NURS 5093 first, followed by NURS 5083 in the summer and NURS 5073 and NURS 5343 in the fall.

NURS 5073	Curriculum Design and Development in Nursing Education	3
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NURS 5083	Methods of Assessment and Evaluation in Nursing Education	3
NURS 5093	Instructional Design and Delivery in Nursing Education	3
NURS 5343	Specialty Development I	3
Total Hours		12

Project Management (OMPM)

Gregory S. Parnell
 Program Director
 4207 Bell Engineering Center
 479-575-3413
 Email: msom@uark.edu

Operations Management Website (<http://operations-management.uark.edu/>)

Graduate Certificate Offered (non-degree)
 Project Management (OMPM)

Admission to the Graduate Certificate program generally follows U of A Graduate School admission policies with the following exceptions:

1. All applicants, including those with advanced degrees, will be evaluated for admission on the basis of their first baccalaureate degree.
2. Students may be eligible for admission by special consideration if the GPA is below 3.0 but above 2.5.
3. Before taking any graduate classes in the program, non-native speakers of English who do not have a conferred undergraduate degree from an accredited U.S. college or university must demonstrate minimum proficiency on one of the following tests of written English: TOEFL, IBT (26), ELPT (75) or GRE/GMAT Analytical Writing (4.5). The English Language Proficiency Policy for the Master of Science in Operations Management requires Level II non-native speakers of English to complete ELAC 4043 Research Writing in the STEM Fields no later than the first semester of graduate level courses.

Former students or alumni of the Master of Science in Operations Management program may use six credit hours (two courses) from the M.S.O.M. program toward equivalent Project Management Certificate courses. If an alumnus has completed all possible combination of courses for the Project Management Certificate, the student may petition to take one additional course chosen by the program to complete the Project Management Graduate Certificate.

Current M.S.O.M. students who are concurrently accepted into the Project Management Certificate program may use all applicable courses for both the M.S.O.M. degree and the Project Management Certificate.

Requirements for Graduate Certificate in Project Management

Required Courses

OMGT 5253	Leadership Principles and Practices	3
OMGT 5783	Project Management for Operations Managers	3
OMGT 5983	Advanced Project Management	3
Choose one elective:		3
OMGT 5373	Quality Management	
OMGT 5433	Cost Estimation Models	
OMGT 5463	Economic Decision Making	

OMGT 5873 Organizing for Change

Total Hours 12

Special Education Transition Services

Ed Bengtson
 Department Head, Curriculum and Instruction
 216 Peabody Hall
 479-575-4209
 Email: egbengts@uark.edu

Suzanne Kucharczyk
 Program Coordinator
 410 Arkansas Avenue
 479-575-6210
 Email: suzannek@uark.edu

Special Education Transition Services Online Program (<https://online.uark.edu/programs/graduate-certificate-special-education-transition-services.php>)

Graduate Certificate Offered:

Special Education Transition Services (nondegree) (SPTS)

Special Education Transition Services Graduate Certificate is designed to prepare school-based professionals (social workers, school psychologists, educational leaders, school counselors, special education teachers, and general education teachers) to provide transition services to students with disabilities. To be admitted, applicants must have a 3.0 GPA or higher in their last 60 hours of course work.

SPED 5713	Career Development and Transition for People with Disabilities	3
SPED 5763	Teaching Individuals with Severe Disabilities	3
SPED 5783	Professional and Family Partnerships	3
SPED 6433	Legal Aspects of Special Education	3
SPED 532V	Practicum in Special Education	3
Total Hours		15

Statistics and Analytics (STAN)

Mark Arnold
 Program Director
 301 Science Engineering Building
 479-575-3351
 E-mail: arnold@uark.edu

Program Description: The graduate certificate in Statistics and Analytics is a cross-college interdisciplinary program that builds on the university's current strengths in the colleges of Arts and Sciences; Business; Education and Health Professions; and Engineering.

Admission to the Graduate Certificate Program: Applicants to the graduate certificate in Statistics and Analytics must meet the admission requirements of the Graduate School.

Requirements for the Graduate Certificate in Statistics and Analytics:

The Graduate Certificate requires 12 hours of courses as specified below.

Choose one of the following: 3-4

STAT 5003	Statistical Methods & STAT 5001L and Statistics Methods Laboratory	
ESRM 6403	Educational Statistics and Data Processing	
ISYS 5503	Decision Support and Analytics	
PLSC 5913	Research Methods in Political Science	
PSYC 5133	Inferential Statistics for Psychology	
SOCI 5013	Advanced Social Research	

Choose one of the following: 3

STAT 5313	Regression Analysis	
INEG 5393	Applied Regression Analysis for Engineers	
PLSC 5943	Advanced Research Methods in Political Science	
PSYC 5143	Advanced Descriptive Statistics for Psychology	
SOCI 5313	Applied Data Analysis	

Choose one of the following: 3

STAT 5353	Methods of Multivariate Analysis	
ISYS 5723	Advanced Multivariate Analysis	
ESRM 6453	Applied Multivariate Statistics	

Choose one of the following: 3

STAT 4373	Experimental Design	
INEG 5333	Design of Industrial Experiments	
ESRM 6413	Experimental Design in Education	

Total Hours 12

STEM Education for K-6 (STEM)

Ed Bengtson
 Department Head, Curriculum and Instruction
 216 Peabody Hall
 479-575-4209
 Email: egbengts@uark.edu

Mike Daugherty
 Program Coordinator
 216 Peabody Hall
 479-575-5119
 Email: mkd03@uark.edu

Graduate Certificate in STEM Education for K-6:

Required courses:

STEM 5033	Introduction to STEM Education	3
or STEM 4033	Introduction to STEM Education	
STEM 5023	Creativity and Innovation in STEM	3
or STEM 4043	Creativity and Innovation in STEM Education	
CIED 5032	Curriculum Design Concepts for Teachers	2
STEM 5203	Problem-Based Mathematics	3
STEM 5213	Teaching Problem-Based Science in the Elementary Grades	3

Total Hours 14

In addition to the required courses, students will maintain a minimum 3.0 GPA; pass Praxis II; complete a year-long internship placement in a local school; and complete an action-research project.

Sustainability (SUST)

David G. Hyatt
Coordinator of Academic Sustainability
Walton College 354
479-575-6085
Email: dhyatt@uark.edu

Email: sust@uark.edu

sustainability.uark.edu (<http://sustainability.uark.edu>)

Graduate Certificate Offered:

Sustainability (non-degree)

Program Description: The Graduate Certificate in Sustainability is interdisciplinary, drawing from faculty and course work across all colleges of the University of Arkansas. The graduate certificate is accessible to all students admitted to the Graduate School, both degree-seeking and non-degree seeking, who wish to pursue advanced study in Sustainability. The purpose of the Graduate Certificate in Sustainability is to provide functional graduate-level knowledge and skills related to the emerging discipline of Sustainability organized around four thematic areas reflecting strength in scholarship of University of Arkansas academic colleges: Sustainability of Social Systems, Sustainability of Natural Systems, Sustainability of Built Systems, and Sustainability of Managed Systems. Students who complete the graduate certificate in Sustainability will be expected to:

1. Articulate commonly accepted definitions of sustainability and discuss various nuances among those definitions as well as engage in analytical thinking to enhance sustainability measures;
2. Address real-world problems of sustainability to reinforce their professional interests.
3. Have an understanding of the interdisciplinary nature of sustainability issues, particularly as they pertain to the thematic areas of knowledge addressed by the graduate certificate (sustainability of natural systems, sustainability of managed systems, sustainability of built systems, and sustainability of human social systems);
4. Be conversant regarding acquisition and analysis of data pertinent to measuring sustainability;
5. Communicate orally, and in writing organized thoughts defining sustainability measures and technical aspects of sustainability;
6. Identify potential strategies to address sustainability issues using appropriate analytical methods and data and provide results of analyses of data using novel sustainability metrics and indicators;
7. Make recommendations, based on data analysis and interpretation, to advance sustainability of individuals or institutions.
8. Develop methods, techniques and tools for implementing sustainability initiatives.

Required Courses

Students must earn a grade of "B" or better for all courses used to fulfill requirements of the Graduate Certificate in Sustainability.

WCOB 5023	Sustainability in Business (Required course for the Graduate Certificate)	3
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Elective courses with sustainability focus selected from a broad menu of offerings in four thematic areas:	12
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Sustainability of Social Systems	
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Sustainability of Natural Systems	
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Sustainability of Built Systems	
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Sustainability of Managed Systems	
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Total Hours	15
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Elective courses must be completed in at least two thematic areas. In addition, nine of these 12 hours must be in courses numbered 5000 or above.

A complete list of elective courses may be found on the university's Sustainability website (<http://sustainability.uark.edu/academics/grad-certificate/certificate-courses.php>).

Courses

SUST 5103. Analysis and Design of Resilient Systems. 3 Hours.

Introduces students to complex systems theory, change theory, systems analysis and modeling, and design theory for resilient systems. This course draws theory and heuristics from multiple disciplines, including but not limited to engineering, architecture, ecology, risk assessment, management, social sciences, political sciences, the arts and the humanities. (Typically offered: Fall)

SUST 5203. Decision Making, Analysis and Synthesis in Sustainability. 3 Hours.

Provides an applied framework for analyzing decision dynamics, supporting and promoting more sustainable decisions, and measuring the sustainability of systems. The course applies theories of change, institutional decision theory, social and institutional constructs of sustainability, indicator and metric development across social, ecological, and economic domains, and communication strategies. (Typically offered: Spring)

SUST 5303. Sustainable Global Food, Energy and Water Systems. 3 Hours.

Provides a detailed review of the existing global food production/distribution and water systems, with an emphasis on scarcity, equity, management and challenges from changing global systems. This course explores the inputs and efficiencies of existing agricultural production systems, and examines equity and value in these systems. (Typically offered: Fall)

SUST 590V. Special Problems in Sustainability. 1-6 Hour.

Special Problems is intended to fulfill a need in the sustainability curriculum to offer one-time pilot course work in any semester prior to the formal curriculum approval process, offer seminars on unusual but timely topics in sustainability on a one-time basis, or independent study for students seeking additional expertise in sustainability research and scholarship. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Teaching English to Speakers of Other Languages (TESL)

Ed Bengtson
Department Head, Curriculum and Instruction
216 Peabody Hall
479-575-5111
Email: egbengts@uark.edu

Janet Penner-Williams
Program Director
216 Peabody Hall
479-575-2897
Email: jpenner@uark.edu

Program Description: A graduate certificate in teaching English to speakers of other languages is recognized worldwide as the entry-level qualification to the English language teaching profession. It is less of a commitment than a full TESL master's degree, but is comprised of accredited coursework that is transferrable later to a graduate degree,

if needed. The program is ideal for domestic or international educators who seek knowledge of focused language instruction. No prior training in language teaching or linguistics is required. The program is also perfect for recent graduates in disciplines such as English, linguistics, literature, education, or world languages who wish to have recognition for preparation in the field of teaching English to speakers of other languages as a complement their main degree. The certificate could also serve retirees and those seeking career opportunities to explore teaching careers in the U.S. or abroad.

Admission Requirements to the Graduate Certificate Programs: In addition to meeting university requirements for admission to the Graduate School as a non-degree seeking, but certificate-seeking student as well as application requirements of the Teaching English to Speakers of other Languages (TESL) graduate program, which includes:

- A completed bachelor's degree at an accredited institution.
- An earned 3.00 GPA on the last 60 hours of undergraduate coursework.
- An earned 3.00 or above on all TESL coursework completed prior to admission to the graduate certificate.

Graduate Certificate in TESL: The graduate certificate in Teaching English to Speakers of other Languages recognizes students who take a concentrated core of courses, 15 hours, focused on second language acquisition, second language methods, second language assessment, teaching people of other cultures, professionalism, English learner parent family engagement, and program design for PK-12 English Learners. Students who earn this certificate have a working knowledge of appropriate programming and are able to apply appropriate teaching and assessment methodology for English learners in PK-16.

A Graduate Certificate in TESL is recognized worldwide as the entry-level qualification to the English language teaching profession. It is less of a commitment than a full TESL Master's degree, but is comprised of accredited coursework that is transferrable later to a graduate degree, if needed. The program is ideal for domestic or international educators who seek knowledge of focused language instruction. No prior training in language teaching or linguistics is required. The program is also perfect for recent graduates in disciplines such as English, Linguistics, Literature, Education, or Foreign Languages who wish to have recognition for preparation in the field of TESL to complement their main degree. The certificate could also serve retirees and those seeking career opportunities to explore teaching careers in the U.S. or abroad.

TESL Certificate requirements:

CIED 5923	Second Language Acquisition	3
CIED 5933	Second Language Methodologies	3
CIED 5943	Teaching People of Other Cultures	3
CIED 5953	Second Language Assessment	3
CIED 599V	Special Topics	3
or CIED 6193	Teaching English Language Learners in the Content Areas	
Total Hours		15

Technical Writing and Public Rhetorics (TWRH)

William Quinn

Department Chair, English
333 Kimpel Hall
479-575-4301
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Adam Pope
Program Director
333 Kimpel Hall
479-575-4301
Email: arpope@uark.edu

Certificate Offered:

Technical Writing and Public Rhetorics (TWRH) (non-degree)

For more information about the Graduate Certificate in Technical Writing and Public Rhetorics, visit the program's website (<http://fulbright.uark.edu/departments/english/graduate/graduate-certificate-technical-writing-public-rhetorics/>). In addition to the general requirements of the Graduate School, the department stipulates that the following conditions must be met.

Requirements: In order to complete the Graduate Certificate in Technical Writing and Public Rhetorics, students must complete 12 credit hours of coursework, with at least 6 of these hours coming from the Technical Writing and Public Rhetorics core curriculum. The additional 6 hours of credit may come from a list of approved elective courses or from additional courses from the core curriculum. Students must earn a grade of 'B' or better for all courses used to fulfill the requirements of the Graduate Certificate in Technical Writing and Public Rhetorics. In addition to coursework, students are required to complete a Technical Writing and Public Rhetorics Portfolio consisting of at least 4 pieces from the student's coursework in the program.

Core Curriculum 6-9

Minimum 6 hours required

ENGL 5513	Document Design for Technical Writers
ENGL 5523	Technical Writing for Online Audiences
ENGL 5533	Technical Writing Praxis

Elective Courses 3-6

Maximum of 6 hours allowed

ENGL 5963	Advanced Studies in Technical Writing and Public Rhetorics
ENGL 5973	Advanced Studies in Rhetoric and Composition
ENGL 6973	Seminar in Rhetoric and Composition

Other relevant graduate coursework will be allowed on a case-by-case basis, subject to administrative approval and topical relevancy to the graduate certificate and its aims.

Portfolio: Students must consult with the Director of the Graduate Certificate in Technical Writing and Public Rhetorics program during their final semester to develop and defend a portfolio. The program director will chair students' portfolio review committee; working with the director, students will choose two additional faculty members to serve on the committee and at least four pieces of writing to include in the portfolio.

Students will work with the committee to polish those pieces to a level appropriate for publication or non-profit, government, or corporate use.

When the portfolio is approved by the committee, students will host a public viewing of their works, and the portfolio will be added to the certificate program's online repository of student work hosted by the university library.

Graduate School of Business

310 Willard J. Walker Hall
University of Arkansas
Fayetteville, AR 72701

Telephone: 479-575-2851
Fax: 479-575-8721

E-mail: gbs@walton.uark.edu
Web: [gbs.uark.edu \(http://gbs.uark.edu/\)](http://gbs.uark.edu/)

Objectives

The Graduate School of Business has as its objective the advancement and dissemination of knowledge in the business and organizational disciplines through scholarly research and excellence in its graduate management education programs.

Admission

Anyone who wishes to earn graduate-level credit, whether as a degree-seeking student or as a non-degree seeking student, must make formal application and be officially admitted by the Graduate School of Business. The Graduate School of Business offers two classifications of admission: Degree Standing and Non-Degree Standing.

1. Degree Standing

The Graduate School of Business shall admit only those applicants to Degree Standing whose enrollment in the Graduate School of Business considers will contribute positively to the quality of life and educational programs of the Graduate School of Business. Unlike the Graduate School, students are simultaneously admitted to the Graduate School of Business and a degree program.

2. Non-Degree Standing

The Graduate School of Business will admit applicants to single semester Non-Degree Standing whose enrollment will not lead to a degree.

Application. Applications for admission to the Graduate School of Business must be accompanied by a \$60 application fee (\$50 for international applicants), which is not refundable and will not apply against the general registration fee if the applicant enrolls. Applicants will not be considered for admission until all required application materials have been received by the Graduate School of Business.

Applicants who are seeking a graduate degree must submit the following items:

1. Application form
2. Application fee (\$60 domestic; \$50 international)
3. Current resume
4. Three letters of recommendation
5. Official transcripts from each college or university attended
6. Statement of Purpose: Two one-page essays
7. Official GMAT or GRE score as per specific program requirements. (M.B.A., M.Acc., A.P.B.A.M.A., E.C.A.N.M.S. and M.I.S.; Ph.D. concentrations: Accounting, Finance, Information Systems, Management, Marketing, and Supply Chain Management)
8. Official GRE score (M.A. Economics and Ph.D. Economics)
9. Official TOEFL or IELTS score (international applicants only)

10. Financial and Supplemental Information form (international applicants only)
11. Educational Summary form (International applicants only)

Applicants are encouraged to use our online application procedure at <http://gbs.uark.edu> or the application packet may be obtained from and should be submitted directly to the following address:

Graduate School of Business
310 Willard J. Walker Hall
1 University of Arkansas
Fayetteville, AR 72701

Graduate School Of Business

Transcripts: For applicants who desire Degree Standing: It is the responsibility of each applicant who desires full graduate standing to request of each college or university at which the student has previously attended that it send directly to the Graduate School of Business one official copy of the student's academic record including all courses, grades, and credits attempted and indication of degree(s) earned.

Note: The fact that courses completed at one institution may be included on a transcript from another institution will not suffice; official transcripts must be received from each institution previously attended. All transcripts become the property of the Graduate School of Business and will not be released to the applicant or to any other person, institution or agency. All application materials, including all official transcripts, should be received by the Graduate School of Business by the published application deadline for the program for which the student is applying.

For students previously enrolled or currently enrolled at the University of Arkansas, Fayetteville, the Graduate School of Business obtains transcripts from the Registrar's Office. For a graduate of the University of Arkansas, Fayetteville (baccalaureate degree), the only transcripts required are those from the University of Arkansas, Fayetteville, and those from each institution attended after completing the University of Arkansas, Fayetteville, degree. Anyone who was previously enrolled, but who is not currently enrolled in the University of Arkansas Graduate School of Business, is considered a "readmission" and is required only to submit an Application for Admission and official transcripts from institutions attended after the University of Arkansas Graduate School of Business enrollment. (See Classification of Admission: Readmission below.)

Deferred Admission: Admission to the Graduate School of Business is for a specific semester only and admission is not deferred. Applicants who wish to change their date of entry after submitting an application must notify the Graduate School of Business Office. Applicants who have already been admitted but who would like to change their date of entry must request that their application be held for consideration. Application materials for applicants who apply for admission, but who do not subsequently enroll, will be retained by the Graduate School of Business Office for one calendar year from the date of the applicant's original proposed semester of entry. However, applicants must file a new Application for Admission to notify the Graduate School of Business of their request for reconsideration. Applicants who are admitted but who do not enroll for one year or more after admission must resubmit the entire application packet and follow procedures for initial admission.

Admission to Degree Standing: Official notice of the decision concerning admission will be sent from the Graduate School of Business for admission to all degree programs.

Adviser: At the time of admission to a degree program in the Graduate School of Business, the student is assigned to a major adviser who acts as the adviser throughout the student's program of study. The appointment of the adviser is made in the student's major department.

International and Resident Alien Applicants: International applicants and resident aliens must submit a minimum score of 550 on the paper-based Test of English as a Foreign Language (TOEFL), 213 on the computer-based version of the TOEFL, 79 on the Internet-based TOEFL or a minimum score of 6.5 on the International English Language Training System (IELTS) taken within the preceding two years, unless their native language is English, they have received a graduate degree from an accredited U.S. graduate school, or they have demonstrated an acceptable level of language proficiency as defined in the Graduate School Handbook located on the Graduate School Web site. International applicants and resident alien applicants may refer to Admissions of this catalog for additional information related to their application.

Non-Native Speakers of English. All applicants, regardless of citizenship, whose first language is not English, must submit a minimum score of 6.5 on the International English Language Testing System (IELTS) or 79 on the Internet-based Test of English as a Foreign Language (TOEFL) or a 58 on the Pearson Test of English-Academic (PTE-A) taken within the preceding two years, unless they have received a graduate degree from an accredited U.S. graduate school, or they have demonstrated an acceptable level of language proficiency as defined in the Graduate School Handbook located on the Graduate School Web site. Students applying to a Ph.D. program in the Sam M. Walton College of Business must submit one of these tests at the time of admission. Resident aliens must submit a copy of their Resident Alien card with their application.

Additional Language Requirement for Doctoral Students: Doctoral students are normally called upon to teach an undergraduate course at some point during their program. The University of Arkansas and the Walton College of Business are committed to providing quality instruction at the undergraduate level. Non-native speakers of English, regardless of citizenship, even if eligible for a TOEFL waiver, must demonstrate competency in both spoken and written English to be eligible for a graduate assistantship that requires direct contact with students in a teaching or tutorial role, in a traditional classroom setting or via distance education.

Competency in spoken English may be demonstrated by:

Submitting a test score of at least 7 on the IELTS (speaking) sub-test, 26 on the Internet-based TOEFL (speaking) sub-test, 71 on the PTE-A (speaking) sub-test, or "pass" on the Spoken Language Proficiency Test (SLPT) and

Competency in written English may be demonstrated by:

a. Submitting a test score of at least a 6.0 on the IELTS (writing) subtest, 26 on the Internet-based TOEFL (writing) subtest, a 4.0 on the GRE, a 4.5 on the GMAT (analytical writing) subtest, a 71 on the PTE-A (writing) sub-test, or a 75 on the English Language Proficiency Test (ELPT)

OR

b. Concurrently enrolling in EASL 0033 Reading and Writing II and EASL 0021 Grammar OR ELAC 2033 Research Writing for Non-Native Speakers and ELAC 0011 Writing Workshop: Grammar through Editing via placement by test scores (5.5 IELTS writing sub-test, 23 Internet-based TOEFL writing sub-test, 3.5 GRE or 4.0 GMAT analytical writing

subtest, 62 PTE-A writing sub-test, or 70 on the ELPT). The Graduate Coordinator or Department Chair must request this option.

In no case will a doctoral student be allowed to teach an undergraduate course without meeting the minimum score requirement on one of the above tests. The Walton College requires that scores demonstrating competency in spoken English be submitted as a part of the application, prior to review by the admissions committee.

English Language Use by Non-Native Speakers. Applicants, regardless of citizenship, whose first language is not English and who are admitted to graduate study at the University of Arkansas, are required to present an acceptable score on one of the following tests: TOEFL (Writing), IELTS (writing), PTE-A (writing), GRE (analytical writing), GMAT (analytical writing) or ELPT (writing). Depending upon exam scores, a student may be required to take one or more EASL course(s) during their first term of study. Students may be required to take the English Language Placement Test (ELPT) prior to the beginning of classes in their first term of study. Non-native speakers in the following categories are exempt from this requirement, although individual departments may re-quire any of these tests for admission.

1. Graduate students who earned bachelor's or master's degrees in U.S. institutions or in foreign institutions where the official and native language is English;
2. Graduate students with an Internet-based TOEFL writing score of 29, IELTS (writing) score of 7.0. or a PTE-A writing score of 80.
3. Graduate students with a 4.5 on the analytical writing portion of the GRE or GMAT.

Diagnostic and placement testing is designed to test students' ability to use English effectively in an academic setting, and its purpose is to promote the success of non-native speakers in completing their chosen course of study at the University of Arkansas. Test results provide the basis for placement into English as a Second Language (EASL) support courses or course sequences. Courses are offered by the Department of World Languages, Literatures and Cultures for those students whose language skills are diagnosed as insufficient for college work at the level to which they have been admitted (undergraduate or graduate study). Credit in EASL courses does not count toward University of Arkansas degrees. Non-native speakers diagnosed as having language competence sufficient for their level of study will not be required to enroll in EASL courses.

The ELPT is administered by Testing Services during New Student Orientation and there is a \$15 charge. Graduate students assessed course work as a result of performance on the ELPT, TOEFL writing, IELTS writing, PTE-A writing, GRE or GMAT analytical writing will be required to complete the EASL course(s) to support initial course work taken in their fields. Graduate departments/degree programs will have the discretion to waive either the requirement for the language evaluation or the required language courses.

TOEFL Waiver for Walton College Professional Graduate Programs.

The publication, "International Student Information," is available from the Graduate and International Admissions Office, 213 Gearhart Hall, 1 University of Arkansas, Fayetteville, Arkansas 72701.

International applicants to a professional program may petition the Graduate School of Business for a TOEFL waiver if the following criteria are met:

- 1) Possess H1B, L1, Green Card or work visa equivalent, AND
- 2) Be 100% employed in the U.S. with English speaking companies for a minimum period of three years

The Program Director (or designee) for the professional program in which the student is seeking admission will interview the applicant and either grant or deny the waiver.

If the TOEFL waiver is denied, in order to be eligible for admission into a professional program, an official TOEFL score meeting Graduate School requirements must be submitted prior to the beginning of the term in which admission is desired.

Classifications of Admission to Graduate Standing

The Graduate School of Business admits students as either degree-seeking or as non-degree-seeking for a single semester. Degree-seeking students are simultaneously admitted to the Graduate School of Business and to the degree program in which they are seeking a degree. Each degree program in the Walton College has its own minimum admissions criteria. Meeting the minimum criteria listed below does not imply that admission will be granted. The minimum requirements for admission to the Graduate School of Business are as follows:

Degree-Seeking/Regular Standing

1. A grade-point average of 2.70 or better (A = 4.00) on all course work taken prior to receipt of a baccalaureate degree from a regionally accredited institution of higher education and an acceptable GMAT or GRE score.
2. A grade-point average of 3.20 or better on the last 60 hours of course work taken prior to the receipt of a baccalaureate degree from a regionally accredited institution of higher education and an acceptable GMAT or GRE score.

Degree-Seeking/Conditional Standing

1. A grade-point average between 2.50 and 2.69 on all course work taken prior to receipt of a baccalaureate degree from a regionally accredited institution of higher education, acceptable GMAT or GRE score.
2. Approval of the Associate Dean for Research and Graduate Programs, on condition that the student makes a cumulative grade-point average of 3.00 or better on the first 12 hours of graduate-level course work in the degree program and meets any other conditions that may be specified by the faculty of the department or program.

Any other consideration for regular admission must be by individual petition to the Associate Dean for Programs and Research and, where pertinent, a recommendation from the appropriate departmental chair will be considered on its own merits, case by case.

Non-Degree Seeking, Single Semester. Students admitted to a single semester non-degree standing must understand that any enrollment taken in this classification will not normally carry degree credit. Transcripts are not required for applicants seeking this single semester non-degree standing.

Persons who are admitted as non-degree seeking and who subsequently decide to pursue a degree must apply for and be admitted into a degree program by the appropriate admissions committee of the Graduate School of Business.

A non-degree seeking student may take no more than twelve semester hours of graduate-level courses that can be counted toward the requirements for a master's degree.

At the time of acceptance into a degree program, the director of the appropriate degree program will recommend to the Graduate School of Business which courses previously taken, if any, are to be accepted in the degree program.

Letter of Good Standing. A graduate student who is in good standing at another regionally accredited institution in the United States may be given admission (non-degree status) to the Graduate School of Business for one semester upon submission of an Application for Admission and a letter of good standing from the dean of the Graduate School at that institution. If, at some time in the future, the student should wish to pursue a degree in the Graduate School of Business or in the University of Arkansas Graduate School, it will be necessary to follow the normal procedures for admission and to have official transcripts sent from each institution previously attended. Graduate courses transferred and used for requirements for a degree at another university cannot be used for a graduate degree at this institution.

Readmission: Readmission to the Graduate School of Business is not automatic.

A student who has not been enrolled during the previous semester (fall or spring) must submit a new application form to the Graduate School of Business along with an official transcript from any institution attended while not enrolled in the Graduate School of Business.

At the time of readmission, the appropriate admissions committee will determine whether to readmit the student and which classes taken during previous enrollments at the Graduate School of Business will be counted toward graduation.

Transfer of Credit. The Graduate School of Business will allow transfer of credit of a maximum of six credit hours under the following circumstances:

1. The hours were earned at an AACSB-accredited school, and
2. The student earned an "A" or "B" in the courses requested for transfer credit, and
3. The master's program coordinator approves the courses for credit toward a master's degree.
4. The student must have graduate standing and the course(s) must be graduate level.

Academic Integrity

As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the university's Academic Integrity Policy (<http://honesty.uark.edu/policy/>) at honesty.uark.edu (<http://honesty.uark.edu/>). Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

Academic Dismissal

Students may be dropped from further study in the Graduate School of Business if, at any time, their performance is considered unsatisfactory

as determined by either the program faculty or the Associate Dean for Programs and Research. Academic or research dishonesty or failure to maintain a specified cumulative grade-point average are considered to be unsatisfactory performance. The Graduate School of Business subscribes to and enforces the Academic Integrity Policy (<https://honesty.uark.edu/policy/>) of the University of Arkansas.

For students enrolled in the Master of Accountancy, Master of Arts in Economics or Master of Information Systems degree programs, the following academic standards apply: Whenever a student has less than a 3.00 cumulative grade-point average on graded course work taken in residence for graduate credit, the student will be placed on academic probation and warned of the possibility of academic dismissal. If the student fails to bring his/her cumulative grade-point average up to or above a 3.00 at the conclusion of the next grading period, he/she will be academically dismissed from the program.

For students enrolled in the Master of Business Administration degree programs, the following academic standards apply: Whenever a student has less than a 2.85 cumulative grade-point average on graded course work taken in residence for graduate credit, the student will be placed on academic probation for the following semester and warned of the possibility of academic dismissal. When the student has accumulated a minimum of 12 hours of graded coursework taken in residence for graduate credit with a cumulative grade-point average below 2.85 and has received at least one warning, he/she will be academically dismissed from the Graduate School of Business.

For students enrolled in the Master of Business Administration degree programs, a cumulative grade-point average of 2.85 is required to be eligible for graduation. Students may take up to an additional six credit hours of graduate coursework in an effort to raise the cumulative grade-point average to 2.85. Students who repeat a course to raise their grade must count the repetition toward the maximum of six additional hours.

Using its own written procedures, the graduate faculty of each master's degree program may recommend that the student be readmitted to the Graduate School of Business. The graduate faculty of the master's degree programs may establish, and state in writing, the requirements for continuation in that program. Non-degree seeking students who are dismissed may petition for readmission to the Graduate School of Business by submitting a written appeal to the Associate Dean for Research and Graduate Programs.

A cumulative grade-point average of 3.00 is required to be eligible for graduation. Students may take up to an additional six credit-hours of graduate coursework in an effort to raise the cumulative grade-point average to 3.00. Students who repeat a course to raise their grade must count the repetition toward the maximum of six additional hours. All requirements for a master's degree must be completed within six calendar years.

This page includes information and policies about the following:

- Academic Grievance Procedures for Graduate Students
- Grievance Policy and Procedures for Graduate Assistants
- Research and Scholarly Misconduct Policies and Procedures

Graduate Student Grievance

The Graduate School of Business of the Sam M. Walton College of Business recognizes that there may be occasions when a graduate student has a grievance about some aspect of his/her academic

involvement. It is an objective of the University of Arkansas that a graduate student may have prompt and formal resolution of his/her academic grievances and that this be accomplished according to orderly procedures. Below are the procedures to be used when a graduate student has an academic grievance with a faculty member or administrator. If the student has a grievance against another student or another employee of the university, or if the student has a grievance that is not academic in nature, the appropriate policy may be found by contacting the Office of Affirmative Action or the Office of the Dean.

Definition of Terms

Graduate Student: Under this procedure, a graduate student is any person who has been formally admitted to the Graduate School of Business of the Sam M. Walton College of Business of the University of Arkansas, Fayetteville, and who is/was enrolled as a graduate-level student at the time the alleged grievance occurred. (Note: Students pursuing a Ph.D. in Business Administration or in Economics should follow the grievance policy of the Graduate School.)

Academic Grievance: An academic grievance is a dispute concerning some aspect of academic involvement arising from an administrative or faculty decision which the graduate student claims is unjust or is in violation of his/her rights and is the result of a university error. Any behavior on the part of a faculty member or administrator, which the student believes to have interfered with his/her academic progress, is subject to a grievance. While a complete enumeration of the student's rights with regard to academic involvement is not possible or desirable, we have provided a short list as illustration. However, as in all cases involving individual rights, whether a specific behavior constitutes a violation of these rights can only be decided in context, following a review by a panel of those given the authority to make such a decision.

In general, the graduate student:

1. has the right to competent instruction;
2. is entitled to have access to the instructor at hours other than class times (office hours);
3. is entitled to know the grading system by which he/she will be judged;
4. has the right to evaluate each course and instructor;
5. has the right to be treated with respect and dignity.

In addition, an academic grievance may include alleged violations of the affirmative action plans of the university related to academic policies and regulations, as well as disputes over grades, graduate assistantship employment agreements, course requirements, graduate/degree program requirements, thesis advisory committee composition, and/or adviser decisions.

Formal Academic Grievance: An academic grievance is considered formal when the student notifies the Dean of the Walton College, in writing, that he/she is proceeding with such a grievance. The implications of this declaration are: 1) all correspondence pertaining to any aspect of the grievance will be in writing and will be made available to the Dean and his/her designee; 2) all documents relevant to the case, including minutes from all relevant meetings, will be part of the complete written record and will be forwarded to the Dean and his/her designee upon receipt by any party to the grievance; 3) the policy contained herein will be strictly followed; and 4) any member of the academic community who does not follow the grievance policy will be subject to disciplinary actions. Filing a formal academic grievance is a serious matter, and the student is strongly encouraged to seek informal resolution of his/her concerns before taking such a step.

Complete Written Record: The “complete written record” refers to all documents submitted as evidence by any party to the complaint, as subject to applicable privacy considerations. (Note: Because the tape recordings of committee meetings may contain sensitive information, including private information pertaining to other students, the tape or verbatim transcription of the tape will not be part of the complete written record. However, general minutes of the meetings, documenting the action taken by the committees, will be part of the record.)

Working Days: Working days shall refer to Monday through Friday, excluding official University holidays.

Procedures

1. Individuals should attempt to resolve claimed grievances first with the person(s) involved, within the department or program, and wherever possible, without resort to formal grievance procedures. The graduate student should first discuss the matter with the faculty member or administrator involved, with the faculty member’s chairperson or degree program coordinator, or with the Walton College Dean or his/her designee. The student’s questions may be answered satisfactorily during this discussion. If the grievance is with the departmental chairperson or program coordinator, the student may choose to meet with the Walton College Dean or his/her designee for a possible informal resolution of the matter.
2. If a student chooses to file a formal academic grievance, the following procedures are to be followed. The students in the Master of Business Administration (M.B.A.) program shall take the appeal in written form to the M.B.A. Program Director. Students in the departmentally based master’s programs shall take the written appeal to the appropriate departmental chairperson. The student shall forward a copy of the written appeal to the Walton College Dean or his/her designee. In the case of a grievance against a departmental chairperson, the M.B.A. Program Director or an administrator who does not report directly to a departmental chairperson, the student will go directly to the Walton College Dean or his/her designee. The appropriate person to receive the written appeal will be referred to as the initial appellate authority. In any case, the Walton College Dean or his/her designee must be notified of the grievance. After discussion between the initial appellate authority (i.e. chairperson/M.B.A. Program Director/Dean and his/her designee) and all parties to the grievance, option 2a, 2b, or 3 may be chosen.
 - a. All parties involved may agree that the grievance can be resolved by a recommendation of the initial appellate authority. In this case, the initial appellate authority will forward a written recommendation to all parties involved in the grievance within 20 working days after receipt of the written grievance. The initial appellate authority is at liberty to use any appropriate method of investigation, including personal interviews and/or referral to an appropriate departmental or program committee for recommendation.
 - b. Alternatively, any party to the grievance may request that the initial appellate authority at once refer the request, together with all statements, documents, and information gathered in his or her investigation, to the applicable reviewing body. For the M.B.A. Program the applicable reviewing body is the M.B.A. Advisory Committee; for other masters programs it is the relevant program advisory committee. The reviewing body shall, within ten working days from the time its chairperson received the request for consideration, present to the initial appellate authority its written recommendations concerning resolution of the grievance. Within ten working days after receiving these recommendations, the initial appellate authority shall provide all parties to the dispute

with copies of the reviewing body’s recommendation and his or her consequent written decision on the matter.

3. If the grievance is not resolved by the procedure outlined in item 2, or if any party to the grievance chooses not to proceed as suggested in item 2, he/she will appeal directly to the Dean of the Walton College or his designee. Whenever a grievance comes to the attention of the Dean, either as a result of a direct appeal or when a grievance has not been resolved satisfactorily at the departmental/program level, the Dean and his/her designee will consult with the person alleging the grievance. If that person decides to continue the formal grievance procedure, the Dean will notify all parties named in the grievance and the relevant program administrator (i.e. departmental chairperson or the M.B.A. Program Director), that a formal grievance has been filed. Within ten working days, the Dean and his/her designee will:
 - a. with the consent of the student, appoint a faculty member as the student’s advocate, and
 - b. utilize an ad hoc committee of five faculty members and two graduate students, chosen to avoid obvious bias or partiality, to review the grievance and report to him/her. The Walton College Dean or his/her designee will serve as the chair of the grievance committee and will vote only in the case of a tie. A voting member of the Graduate School of Business Masters Program Committee will serve as the non-voting secretary of the committee.

The committee shall have access to witnesses and records, may take testimony, and may make a record by taping the hearing. Its charge is to develop all pertinent factual information (with the exception that the student and faculty member/administrator will not be required to be present in any meeting together without first agreeing to do so) and, on the basis of this information, to make a recommendation to the Walton College Dean to either support or reject the appeal. The Dean will then make a decision based on the committee’s recommendation and all other documents submitted by the parties involved. The Dean’s decision, the committee’s written recommendation and a copy of its complete written record (excluding those in which other students have a privacy interest) shall be forwarded to the person(s) making the appeal within 20 working days from the date the committee was first convened; copies shall be sent simultaneously to other parties involved in the grievance. The Graduate School of Business, in such a way that the student’s privacy is protected, shall retain a copy.

4. Within ten working days of the receipt of the Walton College Dean’s decision, any party to the grievance may appeal to the Dean of the University of Arkansas Graduate School as described in step 3 of the procedures of Academic Grievance Procedures for Graduate Students in the Graduate School.
5. When, and only when, the grievance concerns a course grade and the committee’s recommendation is that the grade assigned by the instructor should be changed, the following procedure applies. The committee’s recommendation that the grade should be changed shall be accompanied by a written explanation of the reasons for that recommendation and by a request that the instructor change the grade. If the instructor declines, he/she shall provide a written explanation for refusing. The committee, after considering the instructor’s explanation and upon concluding that it would be unjust to allow the original grade to stand, may then recommend to the department chair that the grade be changed. The department chair will provide the instructor with a copy of the recommendation and ask the instructor to change the grade. If the instructor continues to decline, the department chair may change the grade, notifying

the instructor, the Walton College Dean or his/her designee, and the student of the action. Only the department chair, and only on recommendation of the committee, may change a grade over the objection of the instructor who assigned the original grade. For courses with a specific M.B.A. program designation (MBAD course number prefix) the Walton College Dean or his/her designee shall fulfill the department chair responsibilities described in this section. No appeal or further review is allowed from this action. All grievances concerning course grades must be filed within one calendar year of receiving that grade.

6. The Master of Arts in Economics is the only Graduate School of Business program with a thesis option. When, and only when, a student in that program brings a grievance concerning the composition of his/her thesis committee, the following procedure will apply. The Walton College Dean or his/her designee shall meet with the graduate student and the faculty member named in the grievance, and shall consult the chair of the committee, the department chairperson, and/or the program coordinator for their recommendations. In unusual circumstances, the Dean and his/her designee may remove a faculty member from a student's thesis committee or make an alternative arrangement. With regard to the chair of the thesis committee, this is a mutual agreement between the faculty member and the student to work cooperatively on a research project of shared interest. Either the graduate student or the faculty member may dissolve this relationship by notifying the other party, the departmental chairperson, and the Walton College Dean or his/her designee. However, the student and the adviser should be warned that this may require that all data gathered for the thesis be abandoned and a new research project undertaken with a new faculty adviser.
7. If a grievance, other than those covered by step 5, is not satisfactorily resolved through steps 1 through 4 or 6, an appeal in writing and with all relevant material may be submitted for consideration and a joint decision by the Chancellor of the University of Arkansas, Fayetteville, and the Provost/Vice Chancellor for Academic Affairs. This appeal must be filed within 20 working days of receiving the decision of the Dean of the University of Arkansas Graduate School. Any appeal at this level shall be on the basis of the complete written record only, and will not involve interviews with any party to the grievance. The Chancellor of the University of Arkansas, Fayetteville, and the Provost/Vice Chancellor for Academic Affairs shall make a decision on the matter within 20 working days from the receipt of the appeal. Their decision shall be forwarded in writing to the same persons receiving such a decision in step 4. Their decision is final pursuant to the delegated authority of the Board of Trustees.
8. If any party to the grievance violates this policy, he/she will be subject to disciplinary action. When alleging such a violation, the aggrieved individual shall contact the Walton College Dean in writing, with an explanation of the violation.

Graduate Assistant Grievance Policy

It is the philosophy of the Graduate School that assistantships are not typical employee positions of the university. This has two implications. First, the sponsor should also serve as a mentor to the student and assist, to the extent possible, in facilitating the student's progress toward his/her degree. Second, any questions concerning performance in or requirements of assistantships shall be directed to the Graduate School or, for master's students in business, to the Graduate School of Business. (Note: the term "graduate assistant" will be used to refer to those on other types of appointments as well, such as fellowships, clerkships, etc.)

The Graduate School has the following authority with regard to graduate assistantships:

1. All requests for new positions, regardless of the source of the funds, must be approved by the Graduate School. When the position is approved, the requesting department or faculty member must complete the form, "Request for a New Graduate Assistant Position" and submit it to the Graduate School. All proposed changes in duties for existing graduate assistantships must be approved by the Graduate School prior to their implementation.
2. The duty requirements of the graduate assistantship, including the number of hours required, must be approved by the Graduate School. Fifty percent graduate assistants may not be asked to work more than 20 hours per week (Note: this is not limited to time actually spent in the classroom or lab; the 20 hour requirement also pertains to time required to grade/compute results, develop class/lab materials, etc. Moreover, students cannot be asked to work an average of 20 hours per week, with 30 hours one week and 10 hours the next, for example. The duty hour requirement is no more than 20 hours per week for a 50 percent appointment. See the Graduate Handbook. However, it should also be noted that if the student is engaged in research which will be used in his/her required project, thesis, or dissertation, or if the student is traveling to professional meetings, data sources, etc., the student may work more than 20 hours per week.) The duty requirements must complement the degree program of the graduate student and must abide by the philosophy that the first priority of graduate students is to finish their degrees.
3. The Graduate School, in consultation with the Graduate Council, has the right to set the enrollment requirements for full-time status for graduate assistants.
4. The Graduate School sets the minimum stipend for graduate assistantships, but does not have responsibility for setting the actual stipend. Graduate assistants will be provided with a written statement of the expected duties for their positions, consistent with the duties outlined in the "Request for New Graduate Assistant Position" or any amendments submitted to the Graduate School. A copy of the written statement will be submitted to the Graduate School of Business for inclusion in the student's file. Graduate assistants may be terminated from their positions at any time or dismissed for cause under the procedures of Board Policy No. 405.1. Termination is effected through the giving of a notice, in writing, of that action at least 60 days in advance of the date the employment is to cease. A copy of the notice must be sent to the Dean of the Walton College and to the Dean of the Graduate School.

A graduate assistant has the right to request a review of the termination by the Dean, following the procedure given below. However, a student should be warned that if the grounds for dismissal are based on any of the following, the only defense to the termination is evidence to show that the charges are not true:

1. The student fails to meet the expectations of the assistantship positions, as outlined in the initial written statement provided to them at the beginning of the appointment.
2. The student provides fraudulent documentation for admission to their degree program and/or to their sponsor in applying for the assistantship positions.
3. The student fails to meet certain expectations which need not be explicitly stated by the sponsor, such as the expectation that
 - a. the student has the requisite English language skills to adequately perform the duties of the position;

- b. the student has the appropriate experience and skills to perform the duties of the position; and
 - c. the student maintains the appropriate ethical standards for the position. The Research Misconduct Policy provides one reference source for such ethical standards.
4. The student fails to make good progress toward the degree, as determined by the annual graduate student academic review and defined by program and Graduate School policies.

Definition of Terms

Graduate Assistant. Any graduate student holding a position which requires that the student be admitted to a graduate degree program of the University of Arkansas, regardless of the source of funds, and for whom tuition is paid as a result of that position.

Sponsor. The person responsible for the funding and duty expectations for the graduate assistant.

Formal graduate assistant grievance. Any dispute concerning some aspect of the graduate assistantship, as defined above, which arises from an administrative or faculty decision that the graduate student claims is a violation of his or her rights. The formal graduate assistant grievance does not pertain to cases in which there is a dispute between co-workers.

Violation of graduate assistant's rights. An action is considered a violation of the graduate assistant's rights if:

1. it violates Graduate School policy with regard to graduate assistantships;
2. it threatens the integrity of, or otherwise demeans, the graduate student, regardless of any other consideration;
3. it illegally discriminates or asks the graduate assistant to discriminate;
4. it requires the student to do something which was not communicated as a condition of holding the assistantship (or the underlying expectations outlined above);
5. it terminates the student from an assistantship for behaviors which are irrelevant to the holding of the assistantship or were never included as expectations for the assistantship;
6. it requires the student to do something which violates University policy, the law, or professional ethics.

Note: It is impossible to state all of the conditions which might constitute a violation of graduate assistants' rights or, conversely, which might defend a respondent against charges of such violations. Such complaints require a process of information gathering and discussion that lead to a final resolution of the matter by those who have been given the authority to do so.

Formal grievance. A grievance concerning graduate assistantships/fellowships is considered formal when the student notifies the Dean of the Walton College, in writing, that he/she is proceeding with such a grievance. The implications of this declaration are: a) the student will be provided with an advocate; b) all correspondence pertaining to any aspect of the grievance will be in writing, and will be made available to the Dean; c) all documents relevant to the case, including minutes from all relevant meetings, will be part of the complete written record, and will be forwarded to the Dean upon receipt by any party to the grievance; d) the policy contained herein will be strictly followed; and e) any member of the academic community who does not follow the grievance policy will be subject to disciplinary actions. Filing a formal grievance is a serious

matter, and the student is strongly encouraged to seek informal resolution of his/her concerns before taking such a step.

Respondent. The person who is the object of the grievance.

Procedures

Note: Grievances are confidential. Information about the grievance, including the fact that such a grievance has been filed, may never be made public to those who are not immediately involved in the resolution of the case, unless the student has authorized this release of information or has instigated a course of action which requires the respondent to respond. An exception to this confidentiality requirement is that the immediate supervisor or departmental chairperson of the respondent will be notified and will receive a copy of the resolution of the case. Since grievances against a respondent also have the potential to harm that person's reputation, students may not disclose information about the grievance, including the fact that they have filed a grievance, to any person not immediately involved in the resolution of the case, until the matter has been finally resolved. This is not intended to preclude the student or respondent from seeking legal advice.

1. When a graduate student believes that his/her rights have been violated, as the result of action(s) pertaining to a graduate assistantship he/she holds or has held within the past year, the student shall first discuss his/her concerns with the respondent. If the concerns are not resolved to the student's satisfaction, the student may discuss it with the Dean of the Walton College or his/her designee, and/or with the Office of Affirmative Action. If the concerns are satisfactorily resolved by any of the above discussions, the terms of the resolution shall be reduced to writing, if any of the involved parties desires to have such a written statement.
2. If the student's concerns are not resolved by the above discussions, and he/she chooses to pursue the matter further, the student shall notify the Dean of the Walton College in writing of the nature of the complaint. This notification will include all relevant documentation and must occur within one year from the date of the occurrence. The Dean of the Walton College will inform the Graduate Dean that a grievance has been filed and will, upon request, forward the written complaint and all relevant documentation to the Graduate Dean.
3. Upon receipt of this notification and supporting documentation, the Dean of the Walton College or the Dean's designee will meet with the graduate student. If the student agrees, the Dean or the Dean's designee will notify the respondent of the student's concerns. If the student does not wish for the respondent to be notified, the matter will be dropped. The respondent will be given ten working days from receipt of the Dean's notification to respond to the concerns.
4. The Dean or the Dean's designee will meet again with the student and make an effort to resolve the concerns in a mutually satisfactory manner. If this is not possible, the Dean will refer the case to a committee.
5. Within ten working days from the final meeting between the student and the Dean, the Dean will notify the respondent and will appoint an ad hoc committee of five faculty members and two graduate students chosen to avoid bias or partiality. The Associate Dean of the Walton College or the Dean's designee will serve as the chair of the grievance committee and will vote only in the case of a tie. A voting member of the Walton College Masters Advisory Committee will serve as the non-voting secretary of the committee. At this time, the Dean will also assign an advocate to the student. The advocate must be a member of the graduate faculty. The immediate supervisor of the respondent will serve as his/her advocate. **Note:** The student

and respondent advocates will have the responsibility to help the student/respondent prepare his/her written materials and will attend committee meetings with the student/respondent. The advocate will not speak on behalf of the student/respondent and will not take part in committee discussions of the merits of the case.

6. The committee shall have access to witnesses and records, may take testimony, and may make a record by taping the hearing. Its charge is to develop all pertinent factual information (with the exception that the student and respondent will not be required to be present in any meeting together without first agreeing to do so) and, on the basis of this information, to make a recommendation to the Dean of the Walton College either to support or reject the grievance. The Dean will then make a decision based on the committee's recommendation and all documents submitted by the parties involved. The Dean's decision, the committee's written recommendation, and a copy of all documents submitted as evidence by any party to the complaint, consistent with all privacy considerations, shall be forwarded to the person(s) alleging the grievance within 20 working days from the date the committee was first convened; copies shall be sent simultaneously to other parties involved in the grievance. A copy shall be retained by the Graduate School of Business in such a way that the student's and respondent's privacy is protected.
7. If the decision of the Dean of the Walton College is that the student's concerns should be addressed, the respondent may appeal to the Provost/Vice Chancellor for Academic Affairs of the University, as outlined below in step 10. It should be noted that the Graduate Dean has limited authority to require a sponsor to reappoint a graduate assistant. Consequently, the redress open to the student may be limited.
8. If the decision of the Dean is that the student's concerns should not be addressed, the student may appeal to the Graduate Dean, as outlined below in step 9.
9. If the grievance is not satisfactorily resolved through step 6, an appeal in writing and with all relevant material may be submitted for consideration to the Graduate Dean. This appeal must be filed within 20 working days of receiving the decision of the Dean of the Walton College. Any appeal at this level shall be on the basis of the complete written record and may involve interviews with any party to the grievance. The Graduate Dean shall make a decision on the matter within 20 working days from the date of receipt of the appeal. His/her decision shall be forwarded in writing to the Walton College Dean, the student, and the respondent.
10. Either party to the grievance may appeal the decision of the Graduate Dean by appealing to the Provost/Vice Chancellor for Academic Affairs of the University of Arkansas. The appeal must be submitted in writing and with all relevant material attached. This appeal must be filed within 20 working days of receiving the decision of the Graduate Dean. Any appeal at this level shall be on the basis of the complete written record only and will not involve interviews with any party to the grievance. The Provost/Vice Chancellor for Academic Affairs shall make a decision on the matter within 20 working days from the date of receipt of the appeal. His/her decision shall be forwarded in writing to the Graduate Dean, the Dean of the Walton College, the student and the respondent. This decision is final.
11. If any party to the grievance violates this policy, he/she will be subject to either losing the assistantship position or losing the assistantship. When alleging such a violation, the aggrieved individual shall contact the Walton College Dean or the Graduate Dean, in writing, with an explanation of the violation.

Research and Scholarly Misconduct Policies and Procedures

I. Introduction

A. General Policy

The University of Arkansas is committed to the highest integrity in research and scholarly activity. Actions which fail to meet this standard can undermine the quality of academic scholarship and harm the reputation of the University. This policy is designed to help ensure that all those associated with the University of Arkansas carry out their research and scholarly obligations in a manner that is consistent with the mission and values of the university, and provides a means of addressing instances of suspected research misconduct should they arise.

Principal investigators are responsible for maintaining ethical standards in the projects they direct and reporting any violations to the appropriate university official. Students charged with academic misconduct are subject to separate disciplinary rules governing students, however, such cases may also be reviewed under these policies if applicable under the provisions stated below. The Research Integrity Officer, in consultation with the student's dean shall determine which policy is most appropriate in each case.

A charge of research misconduct is very serious, and will be reviewed carefully and thoroughly. Any allegation of research misconduct will be handled as confidentially and expeditiously as possible. Full attention will be given to the rights and responsibilities of all individuals involved. Charges of research misconduct which are determined not to be made in good faith, as provided for in this policy, may result in administrative action against the charging party.

B. Scope

This statement of policy and procedures is intended to carry out the responsibilities of the University of Arkansas, Fayetteville under the Public Health Service (PHS) Policies on Research Misconduct, 42 CFR Part 93 and the research misconduct policies of other funding agencies, as applicable to particular allegations.

This document applies to allegations of research misconduct (as defined below) involving:

- A person who, at the time of the alleged research misconduct, was employed by, was an agent of, or was affiliated by enrolled student status, contract or agreement with the University of Arkansas, Fayetteville; and
- is accused of plagiarism, fabrication, or falsification of research records produced in the course of research, research training or activities related to that research or research training. This includes any research formally proposed, performed, reviewed, or reported, or any document or record generated in connection with such research, regardless of whether an application or proposal for funds resulted in a grant, contract, cooperative agreement, or other form of support.

Severance of the respondent's relationship with the University, whether by resignation or termination of employment, completion of or withdrawal from studies, or otherwise, before or after initiation of procedures under this policy, will not preclude or terminate research misconduct procedures.

II. Definitions and Standard of Review

Charge. A written allegation of misconduct that triggers the procedures described in this policy.

Complainant. A person who submits a charge of research misconduct.

Deciding Official (DO). The Provost and Vice Chancellor for Academic Affairs who is the institutional official responsible for making determinations, subject to appeal, on allegations of research misconduct and any institutional administrative actions. The Deciding Official will not be the same individual as the Research Integrity Officer and should have no direct prior involvement in the institution's allegation assessment, inquiry, or investigation. Discussing concerns regarding suspected research misconduct, as provided for in Section IV.A. of this policy, shall not be considered direct prior involvement. If the Deciding Official is unable to serve as DO in a particular matter, the Chancellor may appoint an appropriate official to act as the DO for purposes of that matter.

Good Faith Charge. A charge of research misconduct made by a complainant who believes that research misconduct may have occurred. A charge is not in good faith if it is made with reckless disregard for or willful ignorance of facts that would disprove the charge.

Inquiry. The process under the policy for information gathering and preliminary fact-finding to determine if a charge or apparent instance of research misconduct has substance and therefore warrants an investigation.

Investigation. The process under this policy for the formal examination and evaluation of all relevant facts to determine whether research misconduct has occurred, and, if so, the responsible person and the seriousness of the misconduct.

Investigator. Any person, including but not limited to any person holding an academic or professional staff appointment at the University of Arkansas, who is engaged in the design, conduct, or reporting of research.

ORI. The Office of Research Integrity within the U.S. Department of Health and Human Services.

PHS. The Public Health Service within the U.S. Department of Health and Human Services.

Preponderance of Evidence. Evidence which is of greater weight or more convincing than evidence to the contrary; evidence which shows that something more likely than not is true.

Recklessly. To act recklessly means that a person acts in such a manner that the individual consciously disregards a substantial and unjustifiable risk or grossly deviates from the standard of conduct that a reasonable individual would observe; reckless means more than mere or ordinary negligence.

Research. A systematic investigation designed to develop or contribute to generalizable knowledge. The term includes the search for both basic and applied knowledge and well as training methods by which such knowledge may be obtained.

Research Integrity Officer (RIO) means the Chair of the Research Council who is the institutional official responsible for: (1) assessing allegations of research misconduct to determine if the allegations fall within the definition of research misconduct, are covered by 42 CFR Part 93 or other applicable federal policies, and warrant an inquiry on the basis that the

allegation is sufficiently credible and specific so that potential evidence of research misconduct may be identified; (2) overseeing inquiries and investigations; and (3) the other responsibilities described in this policy. If the Research Integrity Officer is unable to serve as RIO in a particular matter, the DO may appoint an appropriate official to act as the RIO for purposes of that matter.

Research Misconduct. Research misconduct means the fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.

1. Fabrication is making up data or results and recording or reporting them.
2. Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
3. Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Research misconduct does not include disputes regarding honest error or honest differences in interpretations or judgments of data, and is not intended to resolve bona fide scientific disagreement or debate. Research misconduct is also not intended to include "authorship" disputes such as complaints about appropriate ranking of co-authors in publications, presentations, or other work, unless the dispute constitutes plagiarism (as defined above).

Research Record. Any data, document, computer file, computer storage media, or any other written or non-written account or object that reasonably may be expected to provide evidence or information regarding the proposed, conducted, or reported research that constitutes the subject of a charge of research misconduct. A research record includes, but is not limited to, grant or contract applications, whether funded or unfunded; grant or contract progress and other reports; laboratory notebooks; notes; printed or electronic correspondence; memoranda of telephone calls; videos; photographs; X-ray film; slides; biological materials; computer files and printouts; manuscripts and publications; equipment use logs; laboratory procurement records; animal facility records; human and animal subject protocols; consent forms; medical charts; and patient research files.

Respondent. The person against whom a charge of research misconduct is directed, or the person whose actions are the subject of an inquiry or investigation.

Standard of Review.

A finding of research misconduct requires that:

1. There be a significant departure from accepted practices of the relevant research community; and
2. The research misconduct be committed intentionally, knowingly, or recklessly; and
3. The allegation be proven by a preponderance of the evidence.

This standard and related definitions are restated in the charge to the investigation committee located in section V.E. of this policy.

III. Rights and Responsibilities

A. Research Integrity Officer

The Chair of the Research Council will serve as the RIO who will have primary responsibility for implementation of the institution's policies and

procedures on research misconduct. These responsibilities include the following duties related to research misconduct proceedings:

- Consult confidentially with persons uncertain about whether to submit an allegation of research misconduct;
- Receive allegations of research misconduct;
- Assess each allegation of research misconduct in accordance with Section V.A. of this policy to determine whether the allegation falls within the definition of research misconduct and warrants an inquiry;
- As necessary, take interim action and notify ORI of special circumstances, in accordance with Section IV.H. of this policy;
- Sequester research data and evidence pertinent to the allegation of research misconduct in accordance with Section V.C. of this policy and maintain it securely in accordance with this policy and applicable law and regulation;
- Provide confidentiality to those involved in the research misconduct proceeding as required by 42 CFR § 93.108 or other applicable law or regulations, or institutional policy;
- Notify the respondent and provide opportunities for him/her to review/comment/respond to allegations, evidence, and committee reports in accordance with Section III.C. of this policy.
- Inform respondents, complainants, and witnesses of the procedural steps in the research misconduct proceeding;
- Appoint the chair and members of the inquiry and investigation committees, ensure that those committees are properly staffed and that there is expertise appropriate to carry out a thorough and authoritative evaluation of the evidence;
- Determine whether each person involved in handling an allegation of research misconduct has an unresolved personal, professional, or financial conflict of interest and take appropriate action, including recusal, to ensure that no person with such conflict is involved in the research misconduct proceeding;
- In cooperation with other institutional officials, take all reasonable and practical steps to protect or restore the positions and reputations of good faith complainants, witnesses, and committee members and counter potential or actual retaliation against them by respondents or other institutional members;
- Keep the Deciding Official and others who need to know apprised of the progress of the review of the allegation of research misconduct;
- Notify and make reports to ORI or other applicable federal agencies as required by 42 CFR Part 93 or other applicable law or regulations;
- Ensure that administrative actions taken by the institution, ORI, or other appropriate agencies are enforced and take appropriate action to notify other involved parties, such as sponsors, law enforcement agencies, professional societies, and licensing boards of those actions; and
- Maintain records of the research misconduct proceeding and make them available to ORI or other appropriate agencies as applicable in accordance with Section VIII.F. of this policy.

B. Complainant

The complainant is responsible for making allegations in good faith, maintaining confidentiality to the extent permitted by law, and cooperating with the inquiry and investigation. As a matter of good practice, the complainant should be interviewed at the inquiry stage and given the transcript of the interview for comment. The complainant must be interviewed during an investigation, and be given the transcript of the interview for comment. The complainant may be provided for comment with (1) relevant portions of the inquiry report (within a time frame that

permits the inquiry to be completed within 60 days of its initiation); and (2) relevant portions of the draft investigation report. In reviewing reports, the complainant must adhere to time limits set by the corresponding committee for timely completion of the inquiry or investigation

C. Respondent

The respondent is responsible for maintaining confidentiality and cooperating with the conduct of an inquiry and investigation. The respondent is entitled to:

- A good faith effort from the RIO to notify the respondent in writing at the time of or before beginning an inquiry;
- An opportunity to comment on the inquiry report and have his/her comments attached to the report;
- Be notified of the outcome of the inquiry, and receive a copy of the inquiry report that includes a copy of, or refers to 42 CFR Part 93 or other applicable law or regulations and the institution's policies and procedures on research misconduct;
- Be notified in writing of the allegations to be investigated within a reasonable time after the determination that an investigation is warranted, but before the investigation begins (within 30 days after the institution decides to begin an investigation), and be notified in writing of any new allegations, not addressed in the inquiry or in the initial notice of investigation, within a reasonable time after the determination to pursue those allegations;
- Be interviewed during the investigation, have the opportunity to correct the recording or transcript, and have the corrected recording or transcript included in the record of the investigation;
- Have a good faith effort made to interview during the investigation any witness who has been reasonably identified by the respondent as having information on relevant aspects of the investigation, have the recording or transcript provided to the witness, have the witness suggest any corrections in the transcript, and have the recording or corrected transcript included in the record of investigation; and
- Receive a copy of the draft investigation report and, concurrently, a copy of, or supervised access to any records or materials on which the report is based, and be notified that any comments must be submitted within 30 days of the date on which the copy was received and that the comments will be considered by the institution and addressed in the final report
- Appeal the decision of the DO as provided in Section XIII.D.

The respondent should be given the opportunity to admit that research misconduct occurred and that he/she committed the research misconduct. With the advice of the RIO and/or other institutional officials, the Deciding Official may terminate the institution's review of an allegation that has been admitted, if the institution's acceptance of the admission and any proposed resolution is approved by ORI or the appropriate federal agency, if required.

D. Deciding Official

The DO will receive the inquiry report and after consulting with the RIO and/or other institutional officials, decide whether an investigation is warranted under this policy, the criteria in 42 CFR § 93.307(d), or other applicable law or regulations. Any finding that an investigation is warranted must be made in writing by the DO and must be provided to ORI or other federal agencies, if required, together with a copy of the inquiry report meeting the requirements of 42 CFR § 93.309, within 30 days of the finding. If it is found that an investigation is not warranted, the DO and the RIO will ensure that detailed documentation of the inquiry is

retained for at least 7 years after termination of the inquiry, so that ORI or other applicable agencies may assess the reasons why the institution decided not to conduct an investigation.

The DO will receive the investigation report and, after consulting with the RIO and/or other institutional officials, decide the extent to which this institution accepts the findings of the investigation and, if research misconduct is found, decide what, if any, institutional administrative actions are appropriate. The DO shall ensure that the final investigation report, the findings of the DO and a description of any pending or completed administrative actions are provided to ORI, as required by 42 CFR § 93.315 or to other federal agencies as required by their respective misconduct policies.

IV. General Policies and Principles

A. Responsibility to Report Misconduct

All institutional members will report observed, suspected, or apparent research misconduct to the RIO, the DO, or their designees. Prior to submitting a formal charge, a potential complainant is encouraged to consult informally with the RIO, the DO, or their designees to consider whether the case involves questions of research misconduct, should be resolved by other University procedures, or does not warrant further action. Contact information for the RIO may be obtained from the Office of Research Support and Sponsored Programs or the listing of Research Council members on the Faculty Senate website. If the circumstances described by the individual do not meet the definition of research misconduct, but further action is required, the RIO will refer the individual or allegation to other offices or officials with responsibility for resolving the problem.

At any time, to the extent permitted by law, an institutional member may have confidential discussions and consultations about concerns of possible misconduct with the RIO, the DO, or their designees and will be counseled about appropriate procedures for reporting allegations and their obligation to cooperate in any inquiry or investigation that may occur.

B. Cooperation with Research Misconduct Proceedings

Institutional members shall cooperate with the RIO and other institutional officials in the review of allegations and the conduct of inquiries and investigations. Institutional members, including respondents, have an obligation to provide evidence relevant to research misconduct allegations to the RIO or other institutional officials.

C. Confidentiality

The RIO shall, as required by 42 CFR § 93.108 or other applicable law or regulation: (1) limit disclosure of the identity of respondents and complainants to those who need to know in order to carry out a thorough, competent, objective and fair research misconduct proceeding; and (2) except as otherwise prescribed by law, limit the disclosure of any records or evidence from which research subjects might be identified to those who need to know in order to carry out a research misconduct proceeding.

D. Conflicts of interest

At each stage of handling an inquiry or subsequent investigation, all persons involved shall be vigilant to prevent any real or perceived conflict of interest, or personal conflicts or relationships between colleagues, from affecting the outcome of the proceedings and resolution of the charges. Possible conflicts of interest may include co-authorship of work within the recent past with any of the individuals directly involved with the alleged misconduct, or professional or personal relationship with the respondent

beyond that of mere acquaintances or colleagues. Committee members shall not have had any personal, professional or financial involvement with the matters at issue in the investigation that might create an appearance of bias or actual bias. If such relationships or involvement are present, the individual shall recuse himself or herself from any investigative or decisional role in the case. If any prospective committee member at any point in the process presents a conflict of interest, that committee member shall be replaced by another appointee. If the RIO has a conflict of interest, the DO shall appoint a replacement; if the DO has a conflict of interest, the Chancellor shall appoint a replacement. The RIO may use a written conflict of interest statement to implement this provision; a sample statement is referenced in the Appendix to this policy.

E. Protecting complainants, witnesses, and committee members

Institutional members may not retaliate in any way against complainants, witnesses, or committee members. Institutional members should immediately report any alleged or apparent retaliation against complainants, witnesses or committee members to the RIO, who shall review the matter and, as necessary, make all reasonable and practical efforts to counter any potential or actual retaliation and protect and restore the position and reputation of the person against whom the retaliation is directed.

F. Protecting the Respondent

As requested and as appropriate, the RIO and other institutional officials shall make all reasonable and practical efforts to protect or restore the reputation of persons alleged to have engaged in research misconduct, but against whom no finding of research misconduct is made.

During the research misconduct proceeding, the RIO is responsible for ensuring that respondents receive all the notices and opportunities provided for in 42 CFR Part 93, or other applicable federal policies, and the policies and procedures of the institution.

G. Adviser to the Respondent

The respondent may consult with an adviser, who may or may not be an attorney. The adviser may not be a principal or witness in the case. The adviser may accompany the respondent to proceedings conducted as a part of the research misconduct proceeding, but shall not speak on behalf of the respondent or otherwise participate in the proceedings. The adviser must maintain confidentiality and be available as needed to ensure that that all proceedings are completed on a timely basis.

H. Interim Administrative Actions and Notifying ORI or Other Federal Agencies of Special Circumstances

Throughout the research misconduct proceeding, the RIO will review the situation to determine if there is any threat of harm to public health, federal funds and equipment, or the integrity of the research process. In the event of such a threat, the RIO will, in consultation with other institutional officials and ORI or other federal agencies, if applicable, take appropriate interim action to protect against any such threat. Interim action might include additional monitoring of the research process and the handling of federal funds and equipment, reassignment of personnel or of the responsibility for the handling of federal funds and equipment, additional review of research data and results or delaying publication. The RIO shall, at any time during a research misconduct proceeding, consult with appropriate university officials and legal counsel immediately if he/she has reason to believe that any of the following conditions exist:

- Health or safety of the public is at risk, including an immediate need to protect human or animal subjects;
- Federal resources or interests are threatened;
- Research activities should be suspended;
- There is a reasonable indication of possible violations of civil or criminal law;
- Federal action is required to protect the interests of those involved in the research misconduct proceeding;
- The research misconduct proceeding may be made public prematurely and federal action may be necessary to safeguard evidence and protect the rights of those involved; or
- The research community or public should be informed.

Following such consultation, the institution shall take appropriate steps to address such conditions, such as by notifying ORI or other applicable agency.

I. Computation of Time

In this policy, any reference to days shall mean calendar days. Any period of time equal to ten days or fewer shall exclude University holidays. If a deadline falls on a weekend or University holiday, the deadline shall be the next University business day.

J. Procedural Changes

1. **Deadlines.** Due to the sensitive nature of allegations of misconduct, each case shall be resolved as expeditiously as possible. The nature of some cases may, however, render normal deadlines difficult to meet. If at any time an established deadline cannot be met, a report shall be filed with the DO setting out the reasons why the deadline cannot be met and estimating when that stage of the process will be completed. A copy of this report shall be provided to the respondent. If PHS funding is involved, an extension must be received from the Office of Research Integrity.
2. **Other Procedural Changes.** Particular circumstances in an individual case may dictate variation from the procedures set out in this policy in order to ensure fair and efficient consideration of the matter. Any change in the procedures must ensure fair treatment of the respondent. Any major deviations from the procedures described in this policy shall be made only with the written approval of the DO in consultation with the respondent. Any minor deviations from the procedures described in this policy shall not require the written approval of the DO.

K. Exclusive Process

The procedures described in this policy constitute the exclusive process for raising and resolving charges of research misconduct.

V. Conducting the Assessment and Inquiry

A. Assessment of Allegations

Upon receiving an allegation of research misconduct, the RIO will immediately assess the allegation to determine whether it is sufficiently credible and specific so that potential evidence of research misconduct may be identified and further review is warranted. The RIO shall also determine whether the alleged misconduct is within the jurisdictional criteria of 42 CFR § 93.102(b), and whether the allegation falls within the definition of research misconduct in 42 CFR § 93.103. An inquiry must be conducted if these criteria are met. In conducting this assessment, the RIO may consult with the institution's legal counsel and other appropriate

University officials. If a charge is frivolous, does not raise questions of research misconduct, is more appropriately resolved by other University procedures, or does not warrant further action, the RIO may, at his or her discretion, handle the matter informally or refer it to the appropriate person or process, and will notify the complainant and anyone else known to be aware of the charge.

The assessment period should be brief, preferably concluded within a week. In conducting the assessment, the RIO need not interview the complainant, respondent, or other witnesses, or gather data beyond any that may have been submitted with the allegation, except as necessary to determine whether the allegation is sufficiently credible and specific so that potential evidence of research misconduct may be identified and further review is warranted. The RIO shall, on or before the date on which the respondent is notified of the allegation, obtain custody of, inventory, and sequester all research records and evidence needed to conduct the research misconduct proceeding, as provided in paragraph C. of this section.

B. Initiation and Purpose of the Inquiry

If the RIO determines that the criteria for an inquiry are met, he or she will immediately initiate the inquiry process. The purpose of the inquiry is to conduct an initial review of the available evidence to determine whether to conduct an investigation. An inquiry does not require a full review of all the evidence related to the allegation.

C. Notice to Respondent; Sequestration of Research Records

At the time of or before beginning an inquiry, the RIO must make a good faith effort to notify the respondent in writing, if the respondent is known. With the approval of the respondent, the RIO will also notify the dean of the school or college in which the respondent holds his or her primary appointment. If the inquiry subsequently identifies additional respondents, they must be notified in writing. On or before the date on which the respondent is notified, or the inquiry begins, whichever is earlier, the RIO must take all reasonable and practical steps to obtain custody of all the research records and evidence needed to conduct the research misconduct proceeding, inventory the records and evidence and sequester them in a secure manner, except that where the research records or evidence encompass scientific instruments shared by a number of users, custody may be limited to copies of the data or evidence on such instruments, so long as those copies are substantially equivalent to the evidentiary value of the instruments. The RIO may consult confidentially with the institution's legal counsel and other appropriate University officials for advice and assistance in this regard. In addition, if necessary, the RIO may consult with ORI or other applicable federal agency.

D. Appointment of the Inquiry Committee

The RIO, in consultation with other institutional officials as appropriate, shall appoint an inquiry committee and committee chair as soon after the initiation of the inquiry as is practical. The inquiry committee must consist of individuals who do not have unresolved personal, professional, or financial conflicts of interest with those involved with the inquiry and should include individuals with the appropriate scientific expertise to evaluate the evidence and issues related to the allegation, interview the principals and key witnesses, and conduct the inquiry. The RIO shall notify the respondent of the proposed inquiry committee membership. The respondent may then submit a written objection to any appointed member of the inquiry committee based on bias or conflict of interest within seven days. If an objection is raised, the RIO shall determine whether to replace the challenged member with a qualified substitute. The RIO's decision

shall be final. The RIO may, with the concurrence of the DO, appoint one or more experts to assist the inquiry committee if necessary to evaluate specific allegations. The RIO shall direct the members of the committee that the investigation and all information relating to the investigation shall be kept confidential.

E. Charge to the Committee and First Meeting

The RIO will prepare a charge for the inquiry committee that:

- Sets forth the time for completion of the inquiry;
- Describes the allegations and any related issues identified during the allegation assessment;
- States that the purpose of the inquiry is to conduct an initial review of the evidence, including the testimony of the respondent, complainant and key witnesses, to determine whether an investigation is warranted, not to determine whether research misconduct definitely occurred or who was responsible;
- States that an investigation is warranted if the committee determines: (1) there is a reasonable basis for concluding that the allegation falls within the definition of research misconduct and is within the jurisdictional criteria of 42 CFR § 93.102(b), if applicable; and, (2) the allegation may have substance, based on the committee's review during the inquiry.
- Informs the inquiry committee that they are responsible for preparing or directing the preparation of a written report of the inquiry that meets the requirements of this Policy and 42 CFR § 93.309(a), if applicable.

At the committee's first meeting, the RIO will review the charge with the committee, discuss the allegations, any related issues, and the appropriate procedures for conducting the inquiry, assist the committee with organizing plans for the inquiry, and answer any questions raised by the committee. The RIO will be present or available throughout the inquiry to advise the committee as needed. Prior to the first meeting, the RIO shall also consult with legal counsel for the institution as to the need for counsel to provide legal advice to the committee at the first meeting and in subsequent phases of the inquiry, including, but not limited to, for the purpose of reviewing institutional policies governing research misconduct proceedings, confidentiality and potential conflicts of interest.

F. Inquiry Process

The inquiry committee shall interview the complainant and the respondent, and may interview witnesses as well as examine relevant research records and materials. Then the inquiry committee will evaluate the evidence, including the testimony obtained during the inquiry. After consultation with the RIO, the committee members will decide whether an investigation is warranted based on the criteria in this policy and 42 CFR § 93.307(d) as applicable. The scope of the inquiry is not required to and does not normally include deciding whether misconduct definitely occurred, determining definitely who committed the research misconduct or conducting exhaustive interviews and analyses. However, if a legally sufficient admission of research misconduct is made by the respondent, misconduct may be determined at the inquiry stage if all relevant issues are resolved. In that case, the institution shall promptly consult with ORI or other appropriate agencies, as as required, to determine the next steps that should be taken. See Section IX.

G. Time for Completion

The inquiry, including preparation of the final inquiry report and the decision of the DO on whether an investigation is warranted, must be completed within 60 days of initiation of the inquiry, unless the RIO

determines that circumstances clearly warrant a longer period. If the RIO approves an extension, the inquiry record must include documentation of the reasons for exceeding the 60-day period. The respondent will be notified of the extension.

VI. The Inquiry Report

A. Elements of the Inquiry Report

A written inquiry report must be prepared that includes the following information: (1) the name and position of the respondent; (2) a description of the allegations of research misconduct; (3) the PHS or other federal support, if any, including, for example, grant numbers, grant applications, contracts and publications listing support; (4) the basis for recommending or not recommending that the allegations warrant an investigation; (5) any comments on the draft report by the respondent or complainant. An outline for reports to be furnished to ORI is referenced in the Appendix to this policy.

Institutional counsel shall review the draft inquiry report prior to transmission of the draft to the respondent. Modifications shall be made as appropriate in consultation with the RIO and the inquiry committee. The inquiry report shall include the following information: the names and titles of the committee members and experts who conducted the inquiry; a summary of the inquiry process used; a list of the research records reviewed; summaries of any interviews; and whether any other actions should be taken if an investigation is not recommended.

B. Notification to the Respondent and Opportunity to Comment

The RIO shall notify the respondent whether the inquiry found an investigation to be warranted, together with a copy of the draft inquiry report, and a copy of or reference to 42 CFR Part 93 or other applicable federal policies and the institution's policies and procedures on research misconduct. The report shall clearly be labeled "DRAFT" in bold and conspicuous type font. The RIO shall notify the respondent that the respondent shall have 10 days to comment on the draft inquiry report. The RIO shall also direct the respondent that the draft report shall be kept confidential.

On a case-by-case basis, the RIO may provide the complainant a copy of the draft inquiry report, or relevant portions of it, for comment. If so, the report shall clearly be labeled "DRAFT" in bold and conspicuous type font, and the complainant will be allowed no more than 10 days to submit comments to the RIO. The complainant shall be directed that the draft report shall be kept confidential.

Any comments that are submitted by the respondent or the complainant shall be attached to the final inquiry report. Based on the comments, the inquiry committee may revise the draft report as appropriate and prepare it in final form. The committee will deliver the final report to the RIO. The RIO shall notify the complainant in writing whether the inquiry found an investigation to be warranted.

C. Institutional Decision and Notification

1. Decision by Deciding Official

The RIO will transmit the final inquiry report and any comments to the DO, who will determine in writing whether an investigation is warranted. The inquiry is completed when the DO makes this determination.

2. Notification to ORI and Respondent

Within 30 days of the DO's decision that an investigation is warranted, the RIO will provide ORI, if required, with the DO's written decision and a copy of the inquiry report. The RIO shall also provide a copy of the DO's written decision and a copy of the inquiry report to the respondent within 30 days of the DO's decision. Subject to confidentiality, the RIO will also notify those institutional officials, if any, who need to know of the DO's decision because they will be directly involved in the investigation or otherwise have a need to know because of their official duties. The RIO must provide the following information to ORI, if required, or other applicable federal agency upon request: (1) the institutional policies and procedures under which the inquiry was conducted; (2) the research records and evidence reviewed, transcripts or recordings of any interviews, and copies of all relevant documents; and (3) the charges to be considered in the investigation.

3. Documentation of Decision Not to Investigate

If the DO decides that an investigation is not warranted, the RIO shall secure and maintain for 7 years after the termination of the inquiry sufficiently detailed documentation of the inquiry to permit a later assessment by applicable federal agencies of the reasons why an investigation was not conducted. These documents must be provided to such agencies or their authorized personnel upon request.

VII. Conducting the Investigation

A. Initiation and Purpose

The investigation must begin within 30 days, after the determination by the DO that an investigation is warranted. The purpose of the investigation is to develop a factual record by exploring the allegations in detail and examining the evidence in depth, leading to recommended findings on whether research misconduct has been committed, by whom, and to what extent. The investigation will also determine whether there are additional instances of possible research misconduct that would justify broadening the scope beyond the initial allegations. This is particularly important where the alleged research misconduct involves clinical trials or potential harm to human subjects or the general public or if it affects research that forms the basis for public policy, clinical practice, or public health practice. The findings of the investigation must be set forth in an investigation report.

B. Notifying ORI and Respondent; Sequestration of Research Records

On or before the date on which the investigation begins, the RIO must: (1) notify the ORI Director of the decision to begin the investigation and provide ORI a copy of the inquiry report, if required; and (2) notify the respondent in writing of the allegations to be investigated. The RIO must also give the respondent written notice of any new allegations of research misconduct within a reasonable amount of time of deciding to pursue allegations not addressed during the inquiry or in the initial notice of the investigation.

The RIO will, prior to notifying respondent of the allegations, take all reasonable and practical steps to obtain custody of and sequester in a secure manner all research records and evidence needed to conduct the research misconduct proceeding that were not previously sequestered during the inquiry. The need for additional sequestration of records for the investigation may occur for any number of reasons, including the institution's decision to investigate additional allegations not considered during the inquiry stage or the identification of records during the inquiry process that had not been previously secured. The procedures to

be followed for sequestration during the investigation are the same procedures that apply during the inquiry.

C. Appointment of the Investigation Committee

The RIO, in consultation with other institutional officials as appropriate, will appoint an investigation committee and the committee chair as soon after the beginning of the investigation as is practical. The investigation committee must consist of at least three individuals who do not have unresolved personal, professional, or financial conflicts of interest with those involved with the investigation and should include individuals with the appropriate scientific expertise to evaluate the evidence and issues related to the allegation, interview the respondent and complainant and conduct the investigation. Individuals appointed to the investigation committee may also have served on the inquiry committee. When necessary to secure the necessary expertise or to avoid conflicts of interest, the RIO may select committee members from outside the institution, or, with concurrence of the DO, may appoint experts to assist the committee in particular aspects of the case. The RIO will notify the respondent of the proposed investigation committee membership and any appointed experts. If the respondent then submits a written objection to any appointed member or expert based on bias or conflict of interest within seven days, the RIO will determine whether to replace the challenged member or expert with a qualified substitute, and the decision of the RIO shall be final.

D. Charge to the Committee and the First Meeting

1. Charge to the Committee

The RIO will define the subject matter of the investigation in a written charge to the committee that:

- Describes the allegations and related issues identified during the inquiry;
- Identifies the respondent;
- Informs the committee that it must conduct the investigation as prescribed in paragraph E. of this section;
- Reviews the definition of research misconduct as stated in this Policy;
- Informs the committee that it must evaluate the evidence and testimony to determine whether, based on a preponderance of the evidence, research misconduct occurred and, if so, the type and extent of it and who was responsible;
- Informs the committee that in order to determine that the respondent committed research misconduct it must find that a preponderance of the evidence establishes that: (1) research misconduct, as defined in this policy, occurred (respondent has the burden of proving by a preponderance of the evidence any affirmative defenses raised, including honest error or a difference of opinion); (2) the research misconduct is a significant departure from accepted practices of the relevant research community; and (3) the respondent committed the research misconduct intentionally, knowingly, or recklessly; and
- Informs the committee that it must prepare or direct the preparation of a written investigation report that meets the requirements of this Policy and any other applicable federal policies, such as 42 CFR § 93.313.

2. First Meeting

The RIO will convene the first meeting of the investigation committee to review the charge, the inquiry report, and the prescribed procedures and standards for the conduct of the investigation, including the necessity for developing a specific investigation plan. The RIO shall also direct

the members of the committee that the investigation and all information relating to the investigation shall be kept confidential. The investigation committee will be provided with a copy of this statement of policy and procedures and any applicable federal research misconduct policies. The RIO will be present or available throughout the investigation to advise the committee as needed. Prior to the first meeting, the RIO shall also consult with legal counsel for the institution as to the need for counsel to provide legal advice to the committee at the first meeting and in subsequent phases in the investigation, including, but not limited to, for the purpose of reviewing institutional policies governing research misconduct proceedings, confidentiality and potential conflicts of interest.

E. Investigation Process

The investigation committee and the RIO must:

- Use diligent efforts to ensure that the investigation is thorough and sufficiently documented and includes examination of all research records and evidence relevant to reaching a decision on the merits of each allegation;
- Take reasonable steps to ensure an impartial and unbiased investigation to the maximum extent practical;
- Interview each respondent, complainant, and make a good-faith effort to interview any other available person who has been reasonably identified as having information regarding any relevant aspects of the investigation, including witnesses identified by the respondent, and record or transcribe each interview, provide the recording or transcript to the interviewee for correction, and include the recording or transcript in the record of the investigation; and
- Pursue diligently all significant issues and leads discovered that are determined relevant to the investigation, including any evidence of any additional instances of possible research misconduct, and continue the investigation to completion.

F. Time for Completion

The investigation is to be completed within 120 days of the first meeting of the investigation committee, including conducting the investigation, preparing the report of findings, providing the draft report for comment and sending the final report to ORI, if applicable. However, if the RIO determines that the investigation will not be completed within this 120-day period, he/she will submit a written request for an extension to the DO and to ORI or other applicable federal agencies, setting forth the reasons for the delay. If the request for an extension is approved by the DO and applicable federal agencies, then the RIO will ensure that periodic progress reports are filed with the approving officials.

G. Amended Charges

If issues of research misconduct that fall outside of the charge arise during the course of the investigation, the committee shall so inform the RIO, including in its communication the evidence on which its concerns are based. The RIO in consultation with the DO and the investigation committee, will consider the issues raised and, in the RIO's discretion, provide the investigation committee with an amended charge. The respondent shall be notified of any such amendments.

VIII. The Investigation Report

A. Elements of the Investigation Report

The investigation committee and the RIO are responsible for preparing a written draft report of the investigation that:

- Describes the nature of the allegation of research misconduct, including identification of the respondent and the respondent's curriculum vitae;
- Describes and documents the federal support, if any, including, for example, the numbers of any grants that are involved, grant applications, contracts, and publications listing federal support;
- Describes the specific allegations of research misconduct considered in the investigation;
- Includes the institutional policies and procedures under which the investigation was conducted;
- Identifies and summarizes the research records and evidence reviewed and identifies any evidence taken into custody but not reviewed; and
- Includes a statement of findings for each allegation of research misconduct identified during the investigation. Each statement of findings must: (1) identify whether the research misconduct was falsification, fabrication, or plagiarism, and whether it was committed intentionally, knowingly, or recklessly; (2) summarize the facts and the analysis that support the conclusion and consider the merits of any reasonable explanation by the respondent, including any effort by respondent to establish by a preponderance of the evidence that he or she did not engage in research misconduct because of honest error or a difference of opinion; (3) identify the specific federal support, if any; (4) identify whether any publications need correction or retraction; (5) identify the person(s) responsible for the misconduct; and (6) list any current support or known applications or proposals for support that the respondent has pending with federal agencies.
- If the committee determines that any allegation of research misconduct is true, the report shall recommend appropriate institutional actions in response to the findings of research misconduct.

The report and other retained documentation must be sufficiently detailed as to permit a later assessment of the investigation. An outline for reports to be furnished to ORI is referenced in the Appendix to this Policy.

B. Comments on the Draft Report and Access to Evidence

The RIO must give the respondent a copy of the draft investigation report for comment and, concurrently, a copy of, or supervised access to the evidence on which the report is based. The report shall clearly be labeled "DRAFT" in bold and conspicuous type font. The respondent will be allowed 30 days from the date he/she received the draft report to submit comments to the RIO. The respondent's comments must be considered and made a part of the final investigation record. The respondent shall be directed that the draft report shall be kept confidential.

On a case-by-case basis, the RIO may provide the complainant a copy of the draft investigation report, or relevant portions of it, for comment. If so, the report shall clearly be labeled "DRAFT" in bold and conspicuous type font, and the complainant will be allowed no more than 30 days from the date on which he/she received the draft report to submit comments to the RIO. The complainant's comments must be included and considered in the final report. The complainant shall be directed that the draft report shall be kept confidential.

C. Decision by Deciding Official

The RIO will assist the investigation committee in finalizing the draft investigation report, including ensuring that the respondent's and, if applicable, complainant's comments are included and considered, and transmit the final investigation report to the DO, who will determine

in writing: (1) whether the institution accepts the investigation report, its findings, and the recommended institutional actions; and (2) the appropriate institutional actions in response to the accepted findings of research misconduct. If this determination varies from the findings of the investigation committee, the DO will, as part of his/her written determination, explain in detail the basis for rendering a decision different from the findings of the investigation committee. Alternatively, the DO may return the report to the investigation committee with a request for further fact-finding or analysis. When a final decision on the case has been reached, whether at this stage or after a subsequent appeal, the RIO will notify the respondent in writing. If the DO's findings are not appealed within ten days, the DO's findings shall become the institution's final decision. At the time of a final decision, whether at this stage or after an appeal, the RIO will also notify the complainant in writing of the final outcome of the case. After informing ORI or other applicable federal agency, as required, the DO will determine whether law enforcement agencies, professional societies, professional licensing boards, editors of journals in which falsified reports may have been published, collaborators of the respondent in the work, or other relevant parties should be notified of the outcome of the case. The RIO is responsible for ensuring compliance with all notification requirements of funding or sponsoring agencies.

D. Appeals

The respondent, within ten days of receiving written notification of the decision of the DO, may file an appeal with the Chancellor. The appeal may result in (i) a reversal or modification of the DO's findings of research misconduct or determinations of institutional action, (ii) the Chancellor may direct the DO to return the report to the investigation committee with a request for further fact-finding or analysis, or (iii) other action the Chancellor deems appropriate. The appeal process must be completed within 120 days of the filing of the appeal unless an extension is granted by appropriate officials and federal agencies. The decision of the Chancellor shall be final.

E. Notice to Federal Agencies of Institutional Findings and Actions

Unless an extension has been granted, the RIO must, within the 120-day period for completing the investigation or the 120-day period for completion of an appeal, submit the following to any applicable federal agencies as required: (1) a copy of the investigation report with all attachments and any appeals; (2) the findings of research misconduct, including who committed the misconduct; (3) a statement of whether the institution accepts the findings of the investigation; and (4) a description of any pending or completed administrative actions against the respondent.

F. Maintaining Records for Review by Federal Agencies

If required, the RIO must maintain and provide to ORI, if required, or other applicable federal agencies upon request "records of research misconduct proceedings" as that term is defined by 42 CFR § 93.317 or other applicable policies, as appropriate. Unless custody has been transferred to an appropriate federal agency or such agency has advised in writing that the records no longer need to be retained, records of research misconduct proceedings must be maintained in a secure manner for 7 years after completion of the proceeding or the completion of any federal proceeding involving the research misconduct allegation. The RIO is also responsible for providing any information, documentation, research records, evidence or clarification requested by ORI or other appropriate federal agency to carry out its review of an allegation of research misconduct or of the institution's handling of such an allegation.

IX. Completion of Cases; Reporting Premature Closures to Federal Agencies

Generally, all inquiries and investigations will be carried through to completion and all significant issues will be pursued diligently. A case may be closed at the inquiry stage if it is determined that an investigation is not warranted. A case may be closed at the investigation stage if there is a finding that no research misconduct was committed. If the alleged misconduct was in the jurisdiction of the ORI or other federal agency, then this finding must be reported to the applicable agency. An advance notification by the RIO to any applicable federal agency must be made if there are plans to close a case at the inquiry, investigation, or appeal stage on the basis that respondent has admitted guilt, a settlement with the respondent has been reached, or for any other reason except those noted above.

X. Institutional Administrative Actions

If the DO and any subsequent appeal determine that research misconduct is substantiated by the findings, then the DO will decide on the appropriate actions to be taken, after consultation with the RIO and the Chancellor. The administrative actions may include, but are not limited to, the following:

- Withdrawal or correction of all pending or published abstracts and papers emanating from the research where research misconduct was found;
- Removal of the responsible person from the particular project, letter of reprimand, special monitoring of future work, probation, suspension, salary reduction, or initiation of steps leading to possible rank reduction or termination of employment;
- Restitution of funds to the grantor agency as appropriate; and
- Other action appropriate to the research misconduct.

XI. Other Considerations

A. Termination or Resignation Prior to Completing Inquiry or Investigation

The termination of the respondent's institutional employment, by resignation or otherwise, before or after an allegation of possible research misconduct has been reported, will not preclude or terminate the research misconduct proceeding or otherwise limit any of the institution's responsibilities under 42 CFR Part 93 or the corresponding research misconduct policies of other federal agencies.

If the respondent, without admitting to the misconduct, elects to resign his or her position after the institution receives an allegation of research misconduct, the assessment of the allegation will proceed, as well as the inquiry and investigation, as appropriate based on the outcome of the preceding steps. If the respondent refuses to participate in the process after resignation, the RIO and any inquiry or investigation committee will use their best efforts to reach a conclusion concerning the allegations, noting in the report the respondent's failure to cooperate and its effect on the evidence.

B. Restoration of the Respondent's Reputation

Following a final finding of no research misconduct, including ORI concurrence where required by 42 CFR Part 93 or other federal agencies, if required, the RIO must, at the request of the respondent, undertake all reasonable and practical efforts to restore the respondent's reputation. Depending on the particular circumstances and the views of the respondent, the RIO should consider notifying those individuals aware of or involved in the investigation of the final outcome, publicizing

the final outcome in any forum in which the allegation of research misconduct was previously publicized, and expunging all reference to the research misconduct allegation from the respondent's personnel file. Any institutional actions to restore the respondent's reputation should first be approved by the DO.

C. Protection of the Complainant, Witnesses and Committee Members

During the research misconduct proceeding and upon its completion, regardless of whether the institution or ORI determines that research misconduct occurred, the RIO must undertake all reasonable and practical efforts to protect the position and reputation of, or to counter potential or actual retaliation against, any complainant who made allegations of research misconduct in good faith and of any witnesses and committee members who cooperate in good faith with the research misconduct proceeding. The DO will determine, after consulting with the RIO, and with the complainant, witnesses, or committee members, respectively, what steps, if any, are needed to restore their respective positions or reputations or to counter potential or actual retaliation against them. The RIO is responsible for implementing any steps the DO approves.

D. Allegations Not Made in Good Faith

If relevant, the DO will determine whether the complainant's allegations of research misconduct were made in good faith, or whether a witness or committee member acted in good faith. If the DO determines that there was an absence of good faith he/she will determine whether any administrative action should be taken against the person who failed to act in good faith.

Appendix

A. Summary of Items that must be Reported or Submitted to the ORI in those Cases Covered by 42 CFR Part 93

(Note: This list is subject to modification based on adherence to current ORI regulations.)

- An annual report containing the information specified by ORI on the institution's compliance with the final rule. Section 93.302(b).
- Within 30 days of finding that an investigation is warranted, the written finding of the responsible official and a copy of the inquiry report. Sections 93.304(d), 93.309(a), and 93.310(a) and (b).
- Where the institution has found that an investigation is warranted, the institution must provide to ORI upon request: (1) the institutional policies and procedures under which the inquiry was conducted; (2) the research records and evidence reviewed, transcripts or recordings of any interviews, and copies of all relevant documents; and (3) the charges for the investigation to consider. Section 93.309.
- Periodic progress reports, if ORI grants an extension of the time limits on investigations or appeals and directs that such reports be submitted. Sections 93.311(c) and 93.314(c).
- Following completion of the investigation report or any appeal: (1) a copy of the investigation report with all attachments and any appeals; (2) the findings of research misconduct, including who committed the misconduct; (3) a statement of whether the institution accepts the findings of the investigation; and (4) a description of any pending or completed administrative actions against the respondent. Section 93.315.
- Upon request, custody or copies of records relevant to the research misconduct allegation, including research records and evidence. Section 93.317(c).

- Notify ORI immediately of the existence of any of the special circumstances specified in Section 93.318.
- Any information, documentation, research records, evidence or clarification requested by ORI to carry out its review of an allegation of research misconduct or the institution's handling of such an allegation. Section 93.400(b).

B. Outline for an Inquiry/Investigation Report for ORI

(Note: A recommended outline for inquiry and investigation reports has been furnished by ORI and is available on the Research Support and Sponsored Programs web site. Committee members should consult this outline in preparing reports. The outline is subject to modification based on adherence to current ORI regulations.)

C. Conflict of Interest Statement

(Note: A sample conflict of interest statement is available on the Research Support and Sponsored Programs web site. This statement shall be provided to the RIO for use in implementing the conflict of interest portions of this policy.)

Registration and Related Topics

The Graduate School's stance on full-time status is thus: Enrollment in nine semester hours (not including audited courses) is considered full-time for graduate students not on assistantship. For graduate assistants or students with research fellowships on 50 percent appointment or more, six semester hours (not including audited courses) of enrollment is considered full-time in the fall and spring semesters. Graduate assistants who are on a 50% appointment for a six-week summer term must earn at least three hours of graduate credit during the summer. However, these credits do not have to be earned in the same session as the appointment, and may be taken at any time during the summer. Tuition and fees for graduate assistants on 50% appointments for a six-week summer term will be paid up to a maximum of 4 hours. Students not on graduate assistantships or fellowships must be enrolled in six hours (not including audited courses) to be full time in the summer.

The Graduate School of Business adheres to the guidelines as set forth above with the exception of full-time status noted below.

Full-Time Status

Enrollment in 9 semester hours (not including audited courses) is considered full-time for graduate students unless otherwise specified by individual degree programs. For full-time enrollment in the summer, consult the Graduate School Handbook, available on the Graduate School Web site, grad.uark.edu (<http://grad.uark.edu>).

Grades and Marks

Final grades for courses are "A," "B," "C," "D," and "F" (except for courses taken in the Bumpers College of Agricultural, Food, and Life Sciences). No credit is earned for courses in which a grade of "F" is recorded. For students admitted to the Graduate School in Fall 2001 or after no credit is earned for courses in which a grade of "F" or "D" is recorded.

A final grade of "F" shall be assigned to a student who is failing on the basis of work completed but who has not completed all requirements. The instructor may change an "F" so assigned to a passing grade if warranted by satisfactory completion of all requirements.

A mark of "I" may be assigned to a student who has not completed all course requirements, if the work completed is of passing quality. An "I" so

assigned may be changed to a grade provided all course requirements have been completed within 12 weeks from the beginning of the next semester of the student's enrollment after receiving the "I." If the instructor does not report a grade within the 12-week period, the "I" shall be changed to an "F." When the mark of "I" is changed to a final grade, this shall become the grade for the semester in which the course was originally taken.

A mark of "AU" (Audit) is given to a student who officially registers in a course for audit purposes (see Registration for Audit).

A mark of "CR" (credit) is given for a course in which the university allows credit toward a degree, but for which no grade points are earned. The mark "CR" is not normally awarded for graduate-level courses but may be granted for independent academic activities. With departmental (or program area) approval and in special circumstances, up to a maximum of six semester hours of "CR" may be accepted toward the requirements for a graduate degree.

A mixing of course letter grades and the mark "CR" is permitted only in graduate-level courses in which instruction is of an independent nature.

A mark of "R" (Registered) indicates that the student registered for master's thesis or doctoral dissertation. The mark "R" gives neither credit nor grade points toward a graduate degree.

A mark of "S" (Satisfactory) is assigned in courses such as special problems and research when a final grade is inappropriate. The mark "S" is not assigned to courses or work for which credit is given (and thus no grade points are earned for such work). If credit is awarded upon the completion of such work, a grade or mark may be assigned at that time and, if a grade is assigned, grade points will be earned.

A mark of "W" (Withdrawal) will be given for courses from which students withdraw after the first 10 class days of the semester and before the drop deadline of the semester.

For numerical evaluation of grades, "A" is assigned 4 points for each semester hour of that grade; "B," 3 points; "C," 2 points; "D," 1 point; and "F," 0 points. Grades of plus and minus are assigned grade-point values in the Bumpers College of Agricultural, Food, and Life Sciences.

Annual Notice of Student Rights Under the Family Educational Rights And Privacy Act (FERPA)

The Graduate School of Business adheres to the Family Educational Rights and Privacy Act (FERPA) which affords students certain rights with respect to their education records, described on page 41.

Annual Graduate Student Academic Review

The Graduate School of Business implements the Graduate Council policy that any student whose program lasts more than three semesters will be reviewed annually by his/her degree program for progress toward the degree. At a minimum, the review will cover progress in the following: a) in completing courses with an adequate grade-point average; b) in completing the thesis/dissertation/project requirements; c) in completing all of the required examinations; d) toward completing other requirements for the degree. When the review of each student is completed, the review form will be signed by the graduate student and the department/program head/chair, as well as other appropriate individuals as designated in the

program review policy. This review will be forwarded to the Graduate School, to be included in the student's file.

Administrative Requirement for Graduation

Application for graduation must be completed in the Graduate School of Business office, filed with the Registrar, and fees paid for the semester in which degree requirements will be completed and graduation effected. If a student fails to complete the degree, the student must then renew the application and pay a renewal fee.

Residency Requirements

The Graduate School of Business adheres to the residency requirements established by the Graduate School as described on page 40.

Degrees Offered

The faculty of the Graduate School, under the authorization of the Board of Trustees, grants the following degrees offered by the Graduate School of Business. The graduate faculty, as represented by the Dean of the Graduate School and through the Graduate Council, has primary responsibility for the development, operating policies, administration, and quality of these programs. Operating through the Graduate Dean, the faculty appoints committees that directly supervise the student's program of study and committees, which, in turn, monitor research activities and approve theses and dissertations.

- Doctor of Philosophy in Economics
- Doctor of Philosophy in Business Administration:
 - Areas of Study:
 - Accounting
 - Information Systems
 - Finance
 - Management
 - Marketing
 - Supply Chain Management
- Master of Accountancy
- Master of Applied Business Analytics
- Master of Arts in Economics
- Master of Business Administration
- Master of Economic Analytics
- Master of Information Systems
- Master of Professional Accounting
- Master of Science in Finance
- Master of Science in Supply Chain Management
- Graduate Certificate in Business
- Graduate Certificate in Enterprise Systems
- Graduate Certificate in Entrepreneurship

Overview – Master's Degrees in the Sam M. Walton College of Business

Each master's degree in the Sam M. Walton College of Business is designed to prepare a student for a career in the professional world of business. The programs provide a broad-based education where critical thinking, creative problem solving and professional resolve are encouraged. Much of the curriculum is team-based, simulating experience

in the corporate environment. Successful students have demonstrated potential for growth, maturity, motivation and leadership.

Overview – Ph.D. Programs in the Sam M. Walton College of Business

The Ph.D. programs in Business Administration and Economics are designed primarily to prepare individuals for teaching, research, service, and collegial roles in academic and research institutions. The degree programs provide: a) an exposure to the functional areas of business, b) intensive study of the relevant body of knowledge in a focused area, and c) skills and tools to conduct research in that area.

Through an agreement with the Academic Common Market, residents of certain Southern states may qualify for graduate enrollment in this Ph.D. degree program (with the emphasis in accounting) as in-state students for fee purposes. Please see the Graduate School's website for general information regarding the declaration of intent, candidacy examinations, dissertation requirements, and final examinations.

An M.B.A. or other appropriate master's degree is generally required for admission. Individuals admitted to the program may be required to take additional courses in accounting, business law, computer information systems, statistics, finance, economics, management, or marketing. The additional courses will be determined by the adviser in the student's concentration with the approval of the Sam M. Walton College of Business Associate Dean for Programs and Research.

Students apply for admission to one of the following areas of study:

- Accounting
- Information Systems
- Finance
- Management
- Marketing
- Supply Chain Management

Requirements for the Ph.D. Programs in the Sam M. Walton College of Business:

1. Course work and seminars: The requirements for the Ph.D. in Business Administration and Ph.D. in Economics will consist of a program of research, appropriate course work, seminars, and independent study as specified by the student's program.
2. Comprehensive Examination: Satisfactory completion of a comprehensive examination in the area of study is required.
3. Dissertation: A dissertation will be written and successfully defended in the area of study.

Graduate Certificates

The Graduate School of Business at the University of Arkansas offers three non-degree programs leading to graduate certificates: Business, Entrepreneurship and Enterprise Systems. Admission and course requirements are described under each tab.

Graduate Certificate in Enterprise Systems

Timothy Paul Cronan
Director
WCOB 215
479-575-6130
cronan@uark.edu

Enterprise Systems Graduate Certificate Program Website (<https://walton.uark.edu/graduate-programs/certificates/>)

The Graduate Certificate in Enterprise Systems is a part-time program offered on campus, blended, and online. It is designed to provide graduate students with knowledge and experience in information systems used in modern enterprise environments. The demand for skilled professionals in information systems continues to outpace the supply of qualified applicants. Students may choose one of three concentrations for the Graduate Certificate in Enterprise Systems: Enterprise Information Systems, Business Analytics, or Enterprise Resource Planning. The certificate program is intended to be completed part-time (ordinarily no more than six hours per semester), and is open to individuals with backgrounds in any discipline.

Admission Requirements: The Graduate Certificate in Enterprise Systems is a part-time program open to individuals with backgrounds in any discipline. Students must apply and be admitted to the Graduate School of Business; the GMAT/GRE requirement is waived for the Graduate Certificate in Enterprise Systems degree program. (Students who have earned a GPA 3.5 or better upon completion of the certificate program and subsequently apply to the part-time Master of Information Systems program (Professional M.I.S.) will not be required to submit a test score). Information regarding Graduate School of Business admission requirements can be found earlier in this chapter.

Requirements for the Graduate Certificate in Enterprise Systems: (12 hours)

To receive the Graduate Certificate in Enterprise Systems, students must select one of the tracks below. Students are required to take 9 hours of coursework in the Walton College of Business and 3 hours of electives related to Enterprise Systems in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below must be approved by the director of the certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Required Course

Choose at least one of the following depending on the track chosen:

ISYS 5173	Blockchain Fundamentals
ISYS 5103	Data Analytics Fundamentals
ISYS 5213	ERP Fundamentals

Blockchain Enterprise Systems Track

This track is open to individuals with backgrounds in fields other than Information Systems and is designed to provide non-IS graduate students with the fundamental knowledge and skills needed to successfully transition to a career in the Information Systems field. Students who complete this track will have exposure to fundamental principles of blockchain, enterprise information systems, and techniques for management and development of blockchain projects.

Required Courses (9 hours)

ISYS 5173	Blockchain Fundamentals	3
ISYS 5133	Blockchain and E Business Development	3
ISYS 5453	Blockchain and Enterprise Data	3
Students should choose 3 hours of coursework from among the following:		3
ISYS 5103	Data Analytics Fundamentals (recommended)	

ISYS 5213	ERP Fundamentals	
ISYS 5463	Enterprise Transaction Systems	
ISYS 5833	Data Management Systems	
Total Hours		12

Business Analytics Track

This track is open to individuals with backgrounds in any discipline and is designed to give business and non-business graduate student's knowledge and experience in the management and use of enterprise data for operations and decision-making. The ability to effectively manage and analyze increasingly large and complex sets of data is highly valued among employers in all disciplines, as "business intelligence" becomes a primary source of competitive advantage in many organizations. Students who complete this track will have a foundation in the effective management and use of relational and dimensional data, the application of statistical decision-making theory, and the exploration and exploitation of data using advanced data mining tools and techniques. Students completing this track may be eligible to receive a certificate endorsed by the SAS Institute.

Required Courses (9 hours)

ISYS 5103	Data Analytics Fundamentals	3
ISYS 5503	Decision Support and Analytics	3
ISYS 5843	Seminar in Business Intelligence and Knowledge Management	3

Students should choose 3 hours of coursework from among the following:

ISYS 511V	IT Toolkit & Skills Seminar (this course may not be used for the Masters of Information Systems Degree)	3
ISYS 5133	Blockchain and E Business Development	
ISYS 5213	ERP Fundamentals	
ISYS 5423	Seminar in Systems Development	
ISYS 5833	Data Management Systems	

Total Hours 12

Enterprise Resource Planning Track

This track is open to individuals with backgrounds in any discipline and is designed to provide business and non-business graduate students a foundation in the effective use, implementation, and customization of Enterprise Resource Planning (ERP) systems. ERP systems support integrated core business processes in nearly every large organization, and knowledge of and experience with these systems are highly valued among employers in all business disciplines. Students who complete this track will have exposure to fundamental principles of ERP and techniques for configuration, implementation, and development of ERP systems. Students completing this track may be eligible to receive a certificate endorsed by SAP America and the SAP University Alliances Program.

Required Courses (9 hours)

ISYS 5213	ERP Fundamentals	3
ISYS 5223	ERP Configuration and Implementation	3
ISYS 5233	Seminar in ERP Development	3

Students should choose 3 hours of coursework from among the following:

ISYS 511V	IT Toolkit & Skills Seminar (recommended)	
ISYS 5103	Data Analytics Fundamentals	
ISYS 5173	Blockchain Fundamentals	

ISYS 5453	Blockchain and Enterprise Data	
ISYS 5833	Data Management Systems	
Total Hours		12

Graduate Certificate in Entrepreneurship

The Graduate Certificate in Entrepreneurship is designed to give graduate students a foundation in the core aspects of entrepreneurship they will need to start successful enterprises, to create and promote new products or service offerings in existing organizations, or to engage in social entrepreneurship. The Certificate program is open to all graduate students at the University of Arkansas, and graduate students from all majors are encouraged to participate. Students who complete the Graduate Certificate in Entrepreneurship will have explored the context, tools, and processes of entrepreneurial activity and will have learned how to apply them to commercial and non-commercial enterprises.

Admission Requirements: The Graduate Certificate in Entrepreneurship is open to all graduate students who are in good standing with the graduate school at their campus. Students must apply and be admitted to the Graduate School of Business. Information regarding Graduate School of Business admission requirements can be found earlier in this chapter.

Requirements for the Graduate Certificate in Entrepreneurship: (12 hours) To receive the Graduate Certificate in Entrepreneurship, students are required to take 9 hours of coursework in the Walton College of Business and 3 hours of electives related to entrepreneurship in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below may be approved by the Director of the Certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Required Courses

Choose one of the following:		3
MGMT 5213	Business Foundations for Entrepreneurs (for non-Business students only)	
MGMT 5313	Strategic Management (required for Business students)	
MGMT 5323	New Venture Development	3
MGMT 5413	New Venture Development II	3

Elective Course

Select one of the following: 3

Dale Bumpers College of Agricultural, Food, and Life Sciences

AGEC 5143	Financial Management in Agriculture
AGEC 5413	Agribusiness Strategy
HDFS 5463	Administration and Leadership in the Helping Professions

J. William Fulbright College of Arts & Sciences

ARTS 596V	Fine Arts Gallery Internship
GDES 594V	Graphic Design Internship
COMM 5403	Organizational Communication Theory
JOUR 5063	Issues in Advertising and Public Relations
JOUR 5323	Documentary Production I

Walton College of Business

MBAD 535V	MBA Internship
MGMT 5993	Entrepreneurship Practicum

MGMT 5363	Innovation & Creativity
MKTG 5433	Consumer and Market Research
MKTG 5553	New Product Development and Strategy
College of Education and Health Professions	
RESM 5463	Sports Facilities Management
ATTR 5473	Administration in Athletic Training
RESM 5843	Tourism
College of Engineering	
INEG 5453	Systems Engineering and Management
INEG 5463	Project Management
INEG 5623	Analysis of Inventory Systems
Graduate School	
MSEN 5383	Research Commercialization and Product Development
MSEN 5821	Ethics for Scientists and Engineers
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Total Hours	12

Accounting (ACCT)

Gary Peters

Department Chair and S. Robson Walton Chair in Accounting
447 Business Building
gpeters@uark.edu

Cory Cassell

Ph.D. Program Director
456 Business Building
ccassell@walton.uark.edu

Master of Accountancy

Master of Professional Accounting

Program Directors

JaLynn Thomas

452A Business Building
jthomas@walton.uark.edu

Jonathan Shipman

461 Business Building
jshipman@walton.uark.edu

Degrees Conferred:

Master of Accountancy

Master of Professional Accounting

Ph.D. in Business Administration (BADM)

Program Description: The William T. Dillard Department of Accounting offers four graduate degree options, a Master of Accountancy, an integrated program combining the undergraduate Bachelor of Science in Business Administration with the Master of Accountancy, a Master of Professional Accounting and the Doctor of Philosophy in Business Administration with an area of study in Accounting. The programs are designed to provide professional preparation at the graduate level for students wishing to pursue accounting-oriented careers in public practice, industry, and government.

Master of Accountancy (M.Acc.) Program

Master of Accountancy Program Website (<https://gsb.uark.edu/accounting-masters-degree/accounting-masters-degree-macc.php>)

The Master of Accountancy (M.Acc.) program is accredited by the AACSB International – The Association to Advance Collegiate Schools of

Business. AACSB accreditation assures quality and promotes excellence and continuous improvement in undergraduate and graduate education for business administration and accounting.

The Master of Accountancy program provides rigorous preparation at the graduate level for students to achieve success in their chosen career path in public practice, industry, or government. Students entering the program are expected to have an undergraduate degree or significant background in accounting. Building on the knowledge developed as an undergraduate, the M.Acc. courses broaden, extend, and integrate the student's knowledge.

Students completing the M.Acc. program develop the following skills:

- **Research:** Students will be able to access, assess, and apply the appropriate standards, regulations, or other information needed to address accounting and business problems.
- **Risk Analysis:** Students will understand business risk, how it affects decisions and how to create strategies to mitigate risk.
- **Problem Solving and Decision Making:** Students will be able to identify problems, consider alternative solutions, analyze the pros and cons of each alternative and support their conclusions.

The M.Acc. program is a full-time program designed to be completed in one year.

Admission Requirements: The M.Acc. program is open to students who have an acceptable undergraduate grade-point average, an acceptable Graduate Management Admission Test (GMAT) score, and (international students only) an acceptable TOEFL or IELTS score. Students entering the program are expected to have completed undergraduate coursework in statistics, mathematics, information systems, accounting, and business. Prior courses must either have been successfully completed within the five years prior to entry to the M.Acc. program, or the student must provide other evidence of current knowledge in these areas. Otherwise, applicants may be required to repeat or complete selected courses, in addition to their degree coursework.

Requirements for the Master of Accountancy Degree: Students with appropriate backgrounds in business administration and economics and with an undergraduate concentration in accounting will be required to complete 30 semester hours of course work beyond the baccalaureate degree.

Ordinarily, students must be enrolled for a minimum of 12 hours during consecutive fall/spring semesters.

Eighteen semester hours of accounting are required, 12 hours of which are specified:

ACCT 5413	Advanced Financial Accounting	3
ACCT 5953	Auditing Standards	3
ACCT 5463	Financial Statement Analysis	3
ACCT 5873	Advanced Taxation	3
<hr/>		
Total Hours		12

A minimum of six semester hours of the student's program must be non-accounting electives. Six semester hours may be either accounting or non-accounting electives.

To ensure that students acquire the skills necessary for career success, the M.Acc. program strongly encourages all students to obtain additional training directly related to the M.Acc. program prior to graduation.

Students are strongly encouraged, but not required, to complete an accounting internship for academic credit, ACCT 535V (<http://catalog.uark.edu/search/?P=ACCT%20310V>). The M.Acc. program considers this training an integral part of the curriculum that allows for the practical application of the theoretical principles taught in accounting courses.

A student may transfer to the M.Acc. program not more than six hours of graduate level credit from an AACSB-accredited graduate program, provided that each course has a grade of “B” or better, and the courses are acceptable to the departmental M.Acc. committee. Students contemplating transfer of credit should consult in advance with both the M.Acc. Adviser and the Graduate School of Business.

A cumulative grade-point average of 3.00 is required on 1) graduate work taken for the degree and 2) all accounting courses (both undergraduate and graduate) taken for the degree. At least 75 percent of the graduate credit hours submitted for the degree must be “A” or “B” grades. The M.Acc. degree program does not require a thesis. Successful completion of a Master of Accountancy Degree from the University of Arkansas will qualify a student to take relevant professional examinations.

For further information, contact the Graduate School of Business: gbs@walton.uark.edu.

Requirements for Master of Professional Accounting with Assurance and Analytics Concentration

Master of Professional Accountancy Website (<https://walton.uark.edu/graduate-programs/professional-masters-accounting-degree/>)

The Master of Professional Accounting program provides rigorous preparation at the graduate level for students to achieve success in their chosen professional accounting career path in public practice, industry, or government. The core includes coursework related to accounting professionalism, analytic skillsets, and advanced financial accounting. Students may concentrate in one of three areas: Analytics and Assurance, Taxation, or Corporate Accounting. All concentrations provide opportunity for professional internship credit and lead to qualification for the Certified Public Accounting exam.

Admission Requirements: The program is open to students who have earned a bachelor’s degree from an accredited institution and who can present evidence of their ability to do graduate work. In addition, they are expected to have already mastered basic accounting concepts or, demonstrated, with an official GMAT test score, the ability to master accounting concepts taught in the program. International applicants must submit an acceptable TOEFL or IELTS score or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis. Students entering the program are expected to have completed undergraduate business and accounting coursework. Prior courses must either have been successfully completed within the five years prior to entry to the program, or the student must provide other evidence of current knowledge in these areas. Otherwise, applicants may be required to repeat or complete selected courses, in addition to their degree coursework. Students from all academic backgrounds are encouraged to apply.

Requirements for the Master of Professional Accounting

Degree: Students whose previous studies have fulfilled requirements

of the common body of knowledge in business and accounting will be required to complete a minimum of 30 hours of graduate work. The required common body of knowledge in accounting includes introductory taxation, intermediate financial accounting, audit, and accounting information systems. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Professional Accounting from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses

ACCT 5123	Corporate Governance and Professionalism	3
ACCT 5413	Advanced Financial Accounting	3
ACCT 5523	Advanced Accounting Information Systems	3
Areas of Concentration		18
ACCT 535V	Professional Accounting Internship or General Graduate Business Elective	3
Total Hours		30

To ensure that students acquire the skills necessary for career success, the program strongly encourages all students to obtain additional training directly related to the Master of Professional Accounting program prior to graduation. Students are strongly encouraged, but not required, to complete an accounting internship for academic credit, [ACCT 535V](#). The program considers this training an integral part of the curriculum that allows for the practical application of the theoretical principles taught in accounting courses. If students do not participate in an internship experience, they can utilize three credit hours of general graduate business electives. Electives are chosen by the student in consultation with and approval of the Program Director in the Department of Accounting. With the approval of the Program Director, senior-level (4000-plus) courses may be taken for graduate credit.

Electives in the concentrations are chosen by the student in consultation with and approval of the director of the Master of Professional Accounting Program in the Department of Accounting. With the approval of the Program Director, senior-level (4000-plus) courses may be taken for graduate credit.

Students who hold non-immigrant status in the United States in the F-1 or J-1 categories are responsible for coordinating any necessary authorization for employment with the Office of International Students and Scholars (ISS). F-1 and J-1 students are strongly advised to discuss training options with the ISS office early in their program, and to make themselves aware of limitations and restrictions related to F-1 or J-1 employment authorization benefits.

After admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all accounting coursework. Additionally, the student must receive a letter grade of at least a “B” in 75 percent of the courses attempted.

ISYS credits may apply toward the Graduate Certificate in Enterprise Systems. Students should consult the director of the certificate program for eligibility.

Additional Requirements for the Assurance and Analytics Concentration

The Assurance & Analytics Concentration provides students with a foundation for applying technology and analytical methodologies to data-centric accounting environments. Students will be able to navigate

data environments, employ analytical tools, and apply them to business decisions and risk analysis.

Assurance and Analytics Concentration

ACCT 5433	Fraud Prevention and Detection	3
ACCT 5463	Financial Statement Analysis	3
ACCT 5953	Auditing Standards	3
Select 9 hours from the following:		9
ISYS 5213	ERP Fundamentals	
ISYS 5223	ERP Configuration and Implementation	
ISYS 5233	Seminar in ERP Development	
ISYS 5103	Data Analytics Fundamentals	
ISYS 5503	Decision Support and Analytics	
ISYS 5833	Data Management Systems	
ISYS 5843	Seminar in Business Intelligence and Knowledge Management	
Total Hours		18

*ISYS credits may apply toward the Graduate Certificate in Enterprise Systems. Students should consult with the director of the certificate program for eligibility.

Requirements for Master of Professional Accounting with Corporate Accounting Concentration

Master of Professional Accountancy Website (<https://walton.uark.edu/graduate-programs/professional-masters-accounting-degree/>)

The Master of Professional Accounting program provides rigorous preparation at the graduate level for students to achieve success in their chosen professional accounting career path in public practice, industry, or government. The core includes coursework related to accounting professionalism, analytic skillsets, and advanced financial accounting. Students may concentrate in one of three areas: Analytics and Assurance, Taxation, or Corporate Accounting. All concentrations provide opportunity for professional internship credit and lead to qualification for the Certified Public Accounting exam.

Admission Requirements: The program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. In addition, they are expected to have already mastered basic accounting concepts or, demonstrated, with an official GMAT test score, the ability to master accounting concepts taught in the program. International applicants must submit an acceptable TOEFL or IELTS score or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis. Students entering the program are expected to have completed undergraduate business and accounting coursework. Prior courses must either have been successfully completed within the five years prior to entry to the program, or the student must provide other evidence of current knowledge in these areas. Otherwise, applicants may be required to repeat or complete selected courses, in addition to their degree coursework. Students from all academic backgrounds are encouraged to apply.

Requirements for the Master of Professional Accounting

Degree: Students whose previous studies have fulfilled requirements of the common body of knowledge in business and accounting will be required to complete a minimum of 30 hours of graduate work. The

required common body of knowledge in accounting includes introductory taxation, intermediate financial accounting, audit, and accounting information systems. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Professional Accounting from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses

ACCT 5123	Corporate Governance and Professionalism	3
ACCT 5413	Advanced Financial Accounting	3
ACCT 5523	Advanced Accounting Information Systems	3
Areas of Concentration		18
ACCT 535V	Professional Accounting Internship or General Graduate Business Elective	3
Total Hours		30

To ensure that students acquire the skills necessary for career success, the program strongly encourages all students to obtain additional training directly related to the Master of Professional Accounting program prior to graduation. Students are strongly encouraged, but not required, to complete an accounting internship for academic credit, [ACCT 535V](#). The program considers this training an integral part of the curriculum that allows for the practical application of the theoretical principles taught in accounting courses. If students do not participate in an internship experience, they can utilize three credit hours of general graduate business electives. Electives are chosen by the student in consultation with and approval of the Program Director in the Department of Accounting. With the approval of the Program Director, senior-level (4000-plus) courses may be taken for graduate credit.

Electives in the concentrations are chosen by the student in consultation with and approval of the director of the Master of Professional Accounting Program in the Department of Accounting. With the approval of the Program Director, senior-level (4000-plus) courses may be taken for graduate credit.

Students who hold non-immigrant status in the United States in the F-1 or J-1 categories are responsible for coordinating any necessary authorization for employment with the Office of International Students and Scholars (ISS). F-1 and J-1 students are strongly advised to discuss training options with the ISS office early in their program, and to make themselves aware of limitations and restrictions related to F-1 or J-1 employment authorization benefits.

After admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all accounting coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

ISYS credits may apply toward the Graduate Certificate in Enterprise Systems. Students should consult the director of the certificate program for eligibility.

Additional Requirements for the Corporate Accounting Concentration

The Corporate Accounting Concentration provides students a broad foundation for understanding the production and use of accounting information in corporate business environments. Students in this concentration will acquire skills to navigate public reporting environments, internal business operations, and financial decision making.

Corporate Accounting Concentration

ACCT 5433	Fraud Prevention and Detection	3
ACCT 5463	Financial Statement Analysis	3
ACCT 5873	Advanced Taxation	3
Select 9 hours from the following (at least 3 hours must include FINN courses):		9
ACCT 5443	Asset Management	
ACCT 5953	Auditing Standards	
BLAW 5003	Commercial Transactions	
FINN 5223	Financial Markets & Valuation	
FINN 5303	Advanced Corporate Financial Management	
FINN 5313	Advanced Commercial Banking	
ISYS 5213	ERP Fundamentals	
SCMT 5633	Introduction to Supply Chain Management	
Graduate Business Elective (ACCT 535V or other as approved by the ACCTMP Director)		
Total Hours		18

Requirements for Master of Professional Accounting with Taxation Concentration

Master of Professional Accountancy Website (<https://walton.uark.edu/graduate-programs/professional-masters-accounting-degree/>)

The Master of Professional Accounting program provides rigorous preparation at the graduate level for students to achieve success in their chosen professional accounting career path in public practice, industry, or government. The core includes coursework related to accounting professionalism, analytic skillsets, and advanced financial accounting. Students may concentrate in one of three areas: Analytics and Assurance, Taxation, or Corporate Accounting. All concentrations provide opportunity for professional internship credit and lead to qualification for the Certified Public Accounting exam.

Admission Requirements: The program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. In addition, they are expected to have already mastered basic accounting concepts or, demonstrated, with an official GMAT test score, the ability to master accounting concepts taught in the program. International applicants must submit an acceptable TOEFL or IELTS score or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis. Students entering the program are expected to have completed undergraduate business and accounting coursework. Prior courses must either have been successfully completed within the five years prior to entry to the program, or the student must provide other evidence of current knowledge in these areas. Otherwise, applicants may be required to repeat or complete selected courses, in addition to their degree coursework. Students from all academic backgrounds are encouraged to apply.

Requirements for the Master of Professional Accounting

Degree: Students whose previous studies have fulfilled requirements of the common body of knowledge in business and accounting will be required to complete a minimum of 30 hours of graduate work. The required common body of knowledge in accounting includes introductory taxation, intermediate financial accounting, audit, and accounting information systems. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Professional

Accounting from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses

ACCT 5123	Corporate Governance and Professionalism	3
ACCT 5413	Advanced Financial Accounting	3
ACCT 5523	Advanced Accounting Information Systems	3
Areas of Concentration		18
ACCT 535V	Professional Accounting Internship or General Graduate Business Elective	3
Total Hours		30

To ensure that students acquire the skills necessary for career success, the program strongly encourages all students to obtain additional training directly related to the Master of Professional Accounting program prior to graduation. Students are strongly encouraged, but not required, to complete an accounting internship for academic credit, [ACCT 535V](#). The program considers this training an integral part of the curriculum that allows for the practical application of the theoretical principles taught in accounting courses. If students do not participate in an internship experience, they can utilize three credit hours of general graduate business electives. Electives are chosen by the student in consultation with and approval of the Program Director in the Department of Accounting. With the approval of the Program Director, senior-level (4000-plus) courses may be taken for graduate credit.

Electives in the concentrations are chosen by the student in consultation with and approval of the director of the Master of Professional Accounting Program in the Department of Accounting. With the approval of the Program Director, senior-level (4000-plus) courses may be taken for graduate credit.

Students who hold non-immigrant status in the United States in the F-1 or J-1 categories are responsible for coordinating any necessary authorization for employment with the Office of International Students and Scholars (ISS). F-1 and J-1 students are strongly advised to discuss training options with the ISS office early in their program, and to make themselves aware of limitations and restrictions related to F-1 or J-1 employment authorization benefits.

After admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all accounting coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

ISYS credits may apply toward the Graduate Certificate in Enterprise Systems. Students should consult the director of the certificate program for eligibility.

Additional Requirements for the Taxation Concentration

The Tax Concentration provides students a broad foundation for understanding the taxation of entities and the relationship of taxes to the overall business decision process. Students will be able to analyze tax problems, interpret the relevant tax code, and identify tax strategies for complex tax situations and business scenarios.

Taxation Concentration

ACCT 5853	State and Local Taxation	3
ACCT 5863	Taxation of Flow-Through Entities	3
ACCT 5873	Advanced Taxation	3

ACCT 5883	Tax Planning	3
ACCT 5893	Multi-jurisdictional Tax Issues	3
BLAW 5003	Commercial Transactions	3
Total Hours		18

B.S.B.A./M.Acc./M.P.Ac. Integrated Program

Integrated B.S.B.A./M.Acc./M.P.Ac Program Website (<https://walton.uark.edu/graduate-programs/accounting-masters-degree/integrated-macc.php>)

The integrated program to the Master of Accountancy is a five-year program of undergraduate and graduate coursework that allows outstanding students to earn the B.S.B.A. and the Master of Accountancy (M.Acc.) or Master of Professional Accounting (M.P.Ac.) degrees at the same time. The professional curriculum, which usually begins in the student's junior year, includes specially designed accounting courses taught in relatively small classes by full-time faculty members. Students accepted into the integrated degree program may concurrently enroll in undergraduate and graduate level courses.

Because M.Acc./M.Pac. graduates are expected to become leaders in the accounting profession, highly motivated students with the personal qualities and intellectual capacity to establish successful careers in public accounting, industry, not-for-profit organizations, and higher education are encouraged to apply.

Admission

Students are admitted to the integrated program according to the following requirements. Admission is granted only for the fall semester; Feb. 15 of the Junior year is the application deadline for those who wish to begin the integrated program the following fall. Students interested in this program must have completed 90 credit hours of study towards the baccalaureate degree (including ACCT 2013, ACCT 3723 and ACCT 3843) by the Feb. 15 deadline.

Acceptance into the integrated program is based upon the discretion of the admissions committee. The committee considers the overall quality of the applications, including the overall grade point average and the grades in ACCT 2013, ACCT 3723 and ACCT 3843. In addition, they are expected to have already mastered basic accounting concepts or, demonstrated, with an official, Graduate Management Admission Test (GMAT) score, as well as other relevant examples of academic ability and leadership. To receive serious consideration by the admissions committee, a student should have a minimum GPA of 3.0 within the applicant's overall university and accounting coursework. Due to the demand for seats in the program, the admissions committee selectively restricts admission into the program based upon the availability of instructional resources. Students must complete at least two long-session semesters in residence in the Master of Professional Accounting or Master of Accountancy program.

Transfer students will be handled on a case-by-case basis.

Satisfactory Progress

Students are expected to make continuous progress toward the degree by completing required accounting coursework each semester. Students who fail to meet the requirements for the M.P.Ac. or M.Acc. program must choose another major of study or finalize their B.S.B.A. in Accounting. Students will be notified before this action is taken and should meet

with an academic advisor in the Undergraduate Programs Office upon notification.

Probation

A student is placed on probation if his or her grade point average in core undergraduate accounting courses falls below 3.00. Except with the consent of the M.Acc./M.P.Ac. Program Director a student on probation may not take graduate accounting courses.

Graduation

To receive an integrated B.S.B.A./M.Acc./M.P.Ac. degree, a student must have a grade point average of at least 3.00 in all coursework taken as part of the minimum 30-hour M.Acc. or M.P.Ac. degree. He or she must also have a grade point average in graduate accounting coursework of at least 3.00.

Degree Requirements

The requirements of B.S.B.A./M.Acc./M.P.Ac. Integrated program are:

1. Undergraduate coursework
 - a. Complete the B.S.B.A. degree requirements and Accounting Major Requirements detailed above.
 - b. Students are strongly encouraged, but not required, to participate in an accounting internship, ACCT 310V, ACCT 310VH, or ACCT 535V.
2. Graduate coursework

Students with appropriate backgrounds in business administration and economics and with an undergraduate concentration in accounting will be required to complete 30 semester hours of course work beyond the baccalaureate degree, at least 21 semester hours of which must be in courses reserved exclusively for graduate students..

All students must be enrolled for a minimum of 9 hours during consecutive fall/spring semesters during their graduate year. The student must be in residence a minimum of 24 weeks (see residency requirements of the Master of Arts/Master of Science).

Students must complete the specified graduate coursework of the M.Acc. or M.P.Ac. degrees as described in the Graduate Catalog.

The M.Acc./M.P.Ac. degree programs do not require a thesis. Successful completion of the integrated B.S.B.A./M.Acc./M.P.Ac. program from the University of Arkansas will qualify a student to take relevant professional examinations.

For further information, write to the M.Acc./M.P.Ac. Adviser, Department of Accounting, Walton College of Business, University of Arkansas, Fayetteville, AR 72701 or contact the Graduate School of Business at gsb@walton.uark.edu.

Ph.D. in Business Administration (Accounting)

Accounting Ph.D. Program Website (<https://walton.uark.edu/graduate-programs/phd-programs/accounting.php>)

Program Structure

The doctoral program in accounting consists of the following elements: course work, two summer papers, a comprehensive examination, and a dissertation. The latter involves an oral defense of both the dissertation proposal as well as the final dissertation. It is anticipated that

all required course work, including required and supporting courses, will be completed in two and a half years (a total of 67 hours including 18 hours of dissertation credit). Students must recognize a joint responsibility in their preparation to perform research and, in some cases, may wish to take courses beyond those specified to strengthen their skills and abilities in fields that will contribute to successful completion of their dissertation.

Required Courses:

ACCT 6013	Graduate Colloquium	3
ACCT 6033	Accounting Research Seminar I	3
ACCT 6133	Accounting Research Seminar II	3
ACCT 6233	Accounting Research Seminar III	3
ACCT 636V	Special Problems in Accounting (students complete two, three hour courses)	6
ACCT 6433		3
ECON 6133	Mathematics for Economic Analysis	3
ECON 6613	Econometrics I	3
ECON 6623	Econometrics II	3
ECON 6213	Microeconomic Theory I	3
WCOB 6111	Seminar in Business Administration Teaching I	1
Supporting Courses		15
Dissertation		
ACCT 700V	Doctoral Dissertation	18
Total Hours		67

Supporting Courses

Fifteen hours of supporting courses are selected by the student in consultation with the accounting doctoral program coordinator. Generally, such courses should be selected to meet the objectives of the student's program and may be concentrated in a specific field in business or outside business (e.g. economics, finance, psychology, statistics, etc.).

Summer Papers

Students are required to complete summer papers during the first and second summers of their residence. The summer paper requirements are formalized in the set of required courses, students enroll in ACCT 636V Special Problems in Accounting during the first and second summers of their residence (see required courses above). The summer papers represent an opportunity to practice the development and execution of a complete research project under the guidance of an experienced faculty member or members. The resulting paper may be co-authored by the doctoral student and the faculty member or members.

Candidacy Examination

After satisfactory completion of all required course work, each Ph.D. student must pass a written candidacy examination prepared by the Doctoral Program Committee of the Department of Accounting and administered on a date selected by the Doctoral Program Committee. Each student is expected to take the written comprehensive exam within 36 months after starting coursework. If the written comprehensive examination is failed, it should be retaken within 6 months after the failure on a date selected by the Doctoral Program Committee of the Department of Accounting. If the written exam is failed a second time, and if the Doctoral Program Committee allows a third sitting, the examination must be retaken within 6 months after the second failure. Failure to satisfactorily complete the written comprehensive examination results in termination from the program.

Students must complete a minimum of 72 graduate credit hours beyond the bachelor's degree and 42 graduate credit hours beyond the master's degree. For students who apply to the degree program without a master's degree, a minimum of 5 additional credit hours (selected in consultation with the Ph.D. coordinator) will be required to fulfill the full degree requirements to include approved graduate courses. Additional hours may be assessed in individual cases to meet specific coursework deficiencies.

Go to the Graduate School's objectives page (p. 424) for a complete list of degree requirements.

Graduate Faculty

Alee, Kristian, Ph.D., M.B.A. (Indiana University), B.S. (Brigham Young University), Associate Professor, 2016.

Atwood, T. J., Ph.D. (University of Illinois), M.B.A. (University of Texas at Austin), B.S. (Western Kentucky University), Associate Professor, 2014.

Bills, Ken, Ph.D. (University of Oklahoma), M.A., B.A. (Southern Utah University), Associate Professor, 2015.

Cassell, Cory A., Ph.D. (Texas A&M University), M.S., B.S. (Trinity University), Associate Professor, 2009.

Crawley, Michael, Ph.D. (University of Texas at Austin), M.B.A., B.S. (Indiana University), Assistant Professor, 2016.

Daily, Cynthia, D.B.A. (Louisiana Tech University), M.B.A., B.B.A. (Henderson State University), Clinical Associate Professor, 2016.

French, Mandy, B.B.A. (University of Oklahoma), Instructor, 2015.

Greenhaw, William Karl, J.D. (University of Arkansas), B.A. (Westminster College), Instructor, 2001.

Hayes, Thomas P., Ph.D. (University of North Texas), M.Acc. (University of Missouri), B.A. (Westminster College), Clinical Assistant Professor, 2019.

Henry, Erin E., Ph.D. (University of Connecticut), Visiting Assistant Professor, 2019.

Jarnagin, Robyn, LL.M. (New York University), J.D., B.S. (University of Montana), Clinical Assistant Professor, 2016.

Keskek, Sami, Ph.D. (Texas A&M University), M.S. (Fatih University), B.S. (Bogazici University), Assistant Professor, 2011.

Leflar, Charles Joseph, Ph.D., M.A. (University of Missouri-Columbia), B.S.B.A. (University of Arkansas), Clinical Professor, 1993.

Norwood, John Martel, J.D. (Tulane University), M.B.A., B.A. (Louisiana State University), Professor, 1981.

Peters, Gary F., Ph.D. (University of Oregon), M.S. (University of Missouri-Columbia), B.S. (Arkansas Tech University), Professor, 2003.

Petrone, Kim, J.D. (Northwestern University), B.A. (Southern Methodist University), Instructor, 2012.

Richardson, Vernon J., Ph.D. (University of Illinois-Urbana-Champaign), M.B.A., B.S. (Brigham Young University), Distinguished Professor, 2005.

Rowe, Stephen, Ph.D. (University of Illinois), M.S. (Loyola University Chicago), B.A. (Covenant College), Assistant Professor, 2016.

Shipman, Jonathan, Ph.D. (University of Tennessee), B.S. (University of Central Arkansas), Associate Professor, 2015.

Terrell, Katie, M.B.A. (University of Arkansas), B.A. (University of Central Arkansas), Instructor, 2012.

Thomas, JaLynn D., B.S. (Louisiana Tech College Ruston Campus), Instructor, 2011.

Courses

ACCT 510V. Special Topics in Accounting. 1-3 Hour.

(Formerly ACCT 410V.) Explore current events, concepts and new developments relevant to Accounting not available in other courses. Graduate degree credit will not be given for both ACCT 410V and ACCT 510V. Prerequisite: ACCT 3723 with a grade of C or better. (Typically offered: Irregular) May be repeated for degree credit.

ACCT 5123. Corporate Governance and Professionalism. 3 Hours.

Aspects of corporate governance related to establishing an ethical corporate culture are addressed. The course examines various aspects of accounting and business ethics including frameworks for ethical reasoning; professional values - including integrity, objectivity, accounting independence, and professional skepticism; and other core values relevant for accountants. Accounting professional ethics codes and rules are also addressed. Corporate governance structures are examined. Prerequisite: Graduate standing in the Masters of Accountancy program. (Typically offered: Irregular)

ACCT 5223. MBA Accounting Analysis. 3 Hours.

Highlights the role played by accounting information in managing supply chains and retail operations. Provides tools for managing cost flows, including activity-based costing, retail accounting, and operational budgeting. Focuses on improving decision making processes, and linking the impact of retail/supply chain decisions to financial statements and shareholder value. (Typically offered: Fall and Spring)

ACCT 5263. Financial Statement Analysis for Executives. 3 Hours.

This course provides a framework for understanding the intersection between business strategy, accounting, economics, and finance. Using historical financial statements as the primary information input, you will employ tools that enable you to better understand the drivers of current performance and risk, forecast future performance, and construct a value estimate. These tools can be applied in a number of contexts including equity valuation, project selection, and managerial evaluation. Not eligible for MAcc program students. Prerequisite: MBA Director consent. (Typically offered: Summer)

ACCT 535V. Professional Accounting Internship. 1-3 Hour.

This course allows a student to experience an internship within a business and benefit from the applied experience. The internship may be designed to offer a wide range of professional accounting experiences in Industry or Public Accounting. The internship must be supervised by a faculty member as well as a member of the firm. MACC Director approval required. Prerequisite: MAcc Director consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ACCT 5413. Advanced Financial Accounting. 3 Hours.

Integrated course which examines the financial reporting, tax, managerial, systems and auditing aspects of major corporate restructurings arising from events such as mergers, acquisitions, spinoffs, reorganizations and downsizing. Prerequisite: ACCT 3753 or equivalent with a grade of C or better or MAcc Director consent. (Typically offered: Spring)

ACCT 5433. Fraud Prevention and Detection. 3 Hours.

An examination of various aspects of fraud prevention and detection, including the sociology of fraud, elements of fraud, types of fraud involving accounting information, costs of fraud, use of controls to prevent fraud, and methods of fraud detection. (Typically offered: Irregular)

ACCT 5443. Asset Management. 3 Hours.

Managing assets to achieve corporate strategy. Included are issues such as strategy formulation, acquisition processes, internal controls, system requirements, accounting measurements, inventory models, re-engineering, capital budgeting, tax issues, and discussion of current business events that have ethical implications. (Typically offered: Irregular)

ACCT 5463. Financial Statement Analysis. 3 Hours.

This course provides a framework for understanding the current economic position and future prospects of firms using corporate financial statements. Specifically, the student will study financial statements and their related footnotes in order to understand the drivers of current performance and risk, forecast future performance, and estimate the intrinsic value implied by those forecasts. These tools can be applied in a number of contexts including equity valuation, project selection, managerial evaluation, and corporate financial statement audits. Prerequisite: ACCT 3723 or equivalent with a grade of C or better. (Typically offered: Irregular)

ACCT 5483. Financial Accounting Research and Theory. 3 Hours.

This course explores our contemporary understanding of financial reporting incentives and outcomes. The course draws upon existing research on the determinants and consequences of financial reporting and examines the roles of various constituents including investors, lenders, financial analysts, managers, regulators, and auditors within the financial reporting environment. Prerequisite: Graduate standing and MAcc Director consent. (Typically offered: Irregular)

ACCT 549V. Special Topics in Accounting. 1-3 Hour.

Seminar in current topics not covered in other courses. Students may enroll in one or more units. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

ACCT 5523. Advanced Accounting Information Systems. 3 Hours.

This course describes accounting systems in technologically advanced environments. Controls and other technical design considerations are described for the input, processing, storage, and reporting of accounting information. Special topics, such as expert systems and artificial intelligence applications in financial accounting, auditing, and tax also receive considerable attention. Prerequisite: MAcc Director consent. (Typically offered: Irregular)

ACCT 5673. Product, Project and Service Costing. 3 Hours.

(Formerly ACCT 4673.) Cost systems with emphasis on information generation for cost management of products, projects and services. The course includes spreadsheet and other computer program analysis. Graduate degree credit will not be given for both ACCT 4673 and ACCT 5673. Prerequisite: ACCT 2023 and ACCT 3723 each with grades of C or better. (Typically offered: Fall)

ACCT 5703. Governmental/Nonprofit Accounting. 3 Hours.

The course will critically examine current issues in governmental and non-profit accounting, financial statement compliance and control for governmental and non-profit entities, and auditing for government and other non-profit organizations. Topics will include examination of state and local government accounting and reporting; sources and applications of taxes and program resources; not-for-profit organization accounting including taxation, regulatory, performance, and compliance issues; industry specific issues in accounting for health care organizations and colleges and universities; and federal governmental accounting. The course will also examine the application processes and compliance procedures for not-for-profit organizations and grants, and will provide a brief introduction to urban planning and economics. Prerequisite: MAcc Director consent. (Typically offered: Irregular)

ACCT 5853. State and Local Taxation. 3 Hours.

This course provides an overview of the basic principles of state and local taxation and the federal constitutional limits for state and local taxing authorities. Emphasis will be on the impact on individuals and multistate entities of income tax, sales tax, property taxes and hybrid tax systems. Prerequisite: ACCT 4203 or graduate standing. (Typically offered: Spring)

ACCT 5863. Taxation of Flow-Through Entities. 3 Hours.

In-depth coverage of the federal tax treatment of pass-through entities and their owners, including Partnerships, LLCs, and S Corporations. Prerequisite: Graduate Standing and MACC Director Consent, including completion of ACCT 4203. (Typically offered: Spring)

ACCT 5873. Advanced Taxation. 3 Hours.

In-depth coverage of the tax treatment of corporations including advanced tax issues. Introduction to tax research including the organization and authority of tax law; accessing and using the tax law; and, applying tax law to taxpayer scenarios. Prerequisite: ACCT 4203 or equivalent with a grade of C or better. (Typically offered: Fall)

ACCT 5883. Tax Planning. 3 Hours.

In-depth coverage of the tax treatment of passthrough business entities including advanced tax issues. Overview of the income tax treatment of estates and trusts. Overview of the essentials of estate and gift taxation. Prerequisite: ACCT 3843 or equivalent with a grade of C or better. (Typically offered: Spring)

ACCT 5893. Multi-jurisdictional Tax Issues. 3 Hours.

This course provides an in-depth examination of multi-jurisdictional tax issues including U.S. federal income taxation of inbound and outbound transactions, state and local taxation, and multi-jurisdictional tax policy issues. Pre- or Corequisite: ACCT 5873. (Typically offered: Spring)

ACCT 5953. Auditing Standards. 3 Hours.

Professional aspects of financial statement auditing and registered auditors. Including ethics and legal responsibilities; internal control testing; critical evaluation of evidence; application of sampling; and reporting problems. Prerequisite: ACCT 4963 or equivalent with a grade of C or better. (Typically offered: Fall)

ACCT 5963. Audit and Assurance Services. 3 Hours.

(Formerly ACCT 4963.) Professional standards and procedures as applied to external and internal assurance engagements. Including coverage of the economic role of assurance providers, engagement planning, risk assessment, evidence gathering, and reporting. Graduate degree credit will not be given for both ACCT 4963 and ACCT 5963. Prerequisite: ACCT 3723 with a grade of C or better. (Typically offered: Fall and Spring)

ACCT 5993. Energy Accounting. 3 Hours.

(Formerly ACCT 4883.) This course covers the basic issues of accounting and financial reporting for energy issues including hydrocarbon production, processing and sales as well as accounting for wind, solar and other alternative energy sources. Covers national and international energy policy, relevant public policy, environmental and geological issues, and considers environmental law, climate and economic topics relevant to energy topics. Graduate degree credit will not be given for both ACCT 4883 and ACCT 5993. Prerequisite: ACCT 3723 and ACCT 3753 each with a grade of B or better, and admission to the MAcc program. (Typically offered: Irregular)

ACCT 6013. Graduate Colloquium. 3 Hours.

Presentation and critique of research papers and proposals. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ACCT 6033. Accounting Research Seminar I. 3 Hours.

First course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, managerial accounting and behavioral accounting. (Typically offered: Irregular)

ACCT 6133. Accounting Research Seminar II. 3 Hours.

Second course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, financial accounting, managerial accounting, behavioral accounting, tax, audit, international accounting, and education. Prerequisite: ACCT 6033. (Typically offered: Irregular)

ACCT 6233. Accounting Research Seminar III. 3 Hours.

Third course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, financial accounting, managerial accounting, behavioral accounting, tax, audit, international accounting, and education. Prerequisite: ACCT 6033. (Typically offered: Irregular)

ACCT 636V. Special Problems in Accounting. 1-6 Hour.

Special research project under supervision of a graduate faculty member. (Typically offered: Fall and Spring)

ACCT 6633. Accounting Research Seminar V. 3 Hours.

Fifth course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, financial accounting, managerial accounting, behavioral accounting, tax, audit, international accounting, and education. Prerequisite: ACCT 6033. (Typically offered: Irregular)

ACCT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Applied Business Analytics (APBA)

Paul Cronan
Program Director
215 Business Building
pcronan@walton.uark.edu

Master of Applied Business Analytics Website (<https://walton.uark.edu/graduate-programs/business-analytics-masters-degree/>)

Degrees Conferred:

Master of Applied Business Analytics (APBA)

The Master of Applied Business Analytics degree focuses on applied analytics for business. This degree is designed to provide professional preparation for positions in business, government, and public service. It provides sufficient flexibility to meet the needs of students with various backgrounds and foster lifelong learning and innovation. Students may choose from a variety of elective analytics courses in Business, Economic Analytics, Statistics, and Educational Statistics and Research Methods.

Requirements for Master of Applied Business Analytics

Admission Requirements: The Master of Applied Business Analytics program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admission Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and resident aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Requirements for the Master of Applied Business Analytics

Degree: Students whose previous studies have fulfilled requirements of the common body of knowledge in business and analytics will be required

to complete a minimum of 30 hours of graduate work. The required common body of knowledge for the Applied Business Analytics degree includes fundamental business and economics concepts as well as fundamental knowledge of statistics.

The Master of Applied Business Analytics program considers work experience an integral part of the curriculum and recommends that students work/intern for up to one year in a position (or positions) which allow for the practical application of the theoretical principles taught in courses. The Master of Applied Business Analytics Degree is a non-thesis degree program. The comprehensive exam will be a component of the Practicum course, ISYS 599V.

Students who hold non-immigrant status in the United States in the F-1 or J-1 categories are responsible for coordinating any necessary authorization for employment with the Office of International Students and Scholars (ISS). F-1 and J-1 students are strongly advised to discuss training options with the Program Director and the ISS office early in their program, and to make themselves aware of limitations and restrictions related to F-1 or J-1 employment authorization benefits.

Pre-Master of Applied Business Analytics Bridging Course 3

ISYS 5213 ERP Fundamentals

Master of Applied Business Analytics Core Courses 15

ISYS 5103 Data Analytics Fundamentals

ISYS 5503 Decision Support and Analytics

ISYS 5833 Data Management Systems

ISYS 5843 Seminar in Business Intelligence and Knowledge Management

ISYS 599V Practicum Seminar

Applied Analytics Electives 9

Students must choose three courses (9 hours) from either the Business and Economics Analytics Elective Courses or Statistics and Educational Statistics and Research Elective Courses:

Business and Economics Analytics Elective Courses

ACCT 5263 Financial Statement Analysis for Executives

ECON 5743 Introduction to Econometrics

ECON 5753 Forecasting

ECON 5763 Economic Analytics

FINN 5173 Energy Finance and Risk Management

FINN 5223 Financial Markets & Valuation

FINN 5333 Investment Theory and Management

ISYS 5173 Blockchain Fundamentals

ISYS 535V Internship Experience

ISYS 5713 Seminar in IS Topics

MGMT 5213 Business Foundations for Entrepreneurs ¹

MGMT 5313 Strategic Management

MGMT 5323 New Venture Development ¹

MGMT 5413 New Venture Development II ¹

MGMT 5613 Leadership and Organizational Behavior

MKTG 5223 Marketing

MKTG 5433 Consumer and Market Research

MKTG 5523 Marketing Analytics

MKTG 5563 Retail Strategy

SCMT 5633 Introduction to Supply Chain Management

SCMT 5663 Retail and CPG Supply Chain Management

SCMT 5693 Predictive Supply Chain Analytics

Statistics and Educational Statistics and Research Elective Courses

ISYS 5203 Experimental Design
or ESRM 641 Experimental Design in Education

ISYS 5723 Advanced Multivariate Analysis
or ESRM 642 Applied Multivariate Statistics

General Elective (advisor approval)	3
Total Hours	30

- ¹ Taking these three Entrepreneurship courses along with another approved course, will make the student eligible to apply for the Entrepreneurship Certificate. These courses may only be taken by prior approval (and may require students to be on campus for three semesters).

Master of Applied Business Analytics (part-time):

The Information Systems Department also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester 5 semester program.

Students in the part-time program begin with the Business Analytics Graduate Certificate program (1st and 2nd semesters). Completion and success in the Business Analytics Graduate Certificate program can be used to provide “evidence of ability” and can be used to waive the requirement for an acceptable test score on the Graduate Management Admission Test (GMAT) or Graduate Record Exam (GRE).

For the part-time program, approval of the Program Director is required to enroll in more than six hours per semester.

Contact the department for additional information or visit <http://gsb.uark.edu/>.

Business Administration (BADM)

Executive M.B.A. website (<https://gsb.uark.edu/executive-mba/>)

Degrees Conferred:

M.B.A.

Ph.D. in Business Administration (BADM)

Graduate Certificates (non-degree):

Graduate Certificate in Business

Graduate Certificate in Entrepreneurship

Program Description: Designed for working professionals, the Business Administration program offers two concentrations at the master's level: the Executive M.B.A. and the Executive Healthcare M.B.A. These hybrid/online programs allow students to obtain an Executive M.B.A. or an Executive Healthcare M.B.A. in two years by attending classes approximately one Saturday each month. The Ph.D. in Business Administration is also offered as concentrations with requirements listed in the various respective departments of Walton College.

The Business Administration program also offers two graduate certificates, one in business and one in entrepreneurship.

Requirements for the Full-Time M.B.A. Concentration

Admission to the M.B.A.: Students must be admitted to the Graduate School of Business and to the M.B.A. program by the M.B.A. Admissions

Committee. Admission to the M.B.A. program is based upon an acceptable GMAT or GRE score, an acceptable grade-point average, recommendations, essays, and related work experience. For questions regarding admission requirements for the M.B.A. program, please access information online at gsb.uark.edu (<http://gsb.uark.edu>) or contact the Graduate School of Business at gsb@walton.uark.edu.

Prerequisites to Degree Program: Students entering the M.B.A. program are expected to have already mastered basic business concepts or, demonstrated, with an official GMAT or GRE test score, the ability to master business concepts taught in the program. Mastery of the aforementioned topics must be demonstrated before entering the program. Students without academic backgrounds in business may be required to take additional hours or noncredit preparatory classes prior to enrollment in the M.B.A. program.

Requirements for a Master of Business Administration Degree

Requirements include one or more courses from each of the following core areas: People Management, Ethics, and Leadership; Information Technology and Analytics; Accounting and Financial Capital; Marketing and Supply Chain Management; and Strategic and International Management. In addition, requirements include two to four courses from each concentration's specialization track.

Requirements for the M.B.A. are fulfilled through one of the following three concentrations: Full-Time M.B.A., Executive M.B.A., and Executive Healthcare M.B.A.

Requirements for the Full-Time M.B.A. concentration:

Core Courses

People Management, Ethics and Leadership		
MGMT 5223	Business Leadership and Ethics	3
MGMT 5391	Business History and Practice	1
Information Technology and Analytics		
ISYS 5363	Business Analytics	3
ISYS 5433	Enterprise Systems	3
Accounting and Financial Capital		
FINN 5223	Financial Markets & Valuation	3
ACCT 5223	MBA Accounting Analysis	3
Marketing and Supply Chain Management		
MKTG 5103	Introduction to Marketing	3
SCMT 5633	Introduction to Supply Chain Management	3
Strategic and International Management		
ECON 5243	Managerial Economics	3
MGMT 5313	Strategic Management	3
ECON 537V	Global Business	1
	or MGMT 537V Global Business	
Departmental 636V	Special Topics or Special Problems in Business	3
Global Experience/Study Abroad		3
MBAD 536V	Study Abroad-Special Problems (Su)	
Tracks		12
Full Time M.B.A. concentration students must select from one of the following tracks:		
Retail		
MKTG 5433	Consumer and Market Research	
MKTG 5523	Marketing Analytics	

MKTG 5553	New Product Development and Strategy	
MKTG 5563	Retail Strategy	
Supply Chain Management		
SCMT 5623	Supply Chain Innovation and Technology	
SCMT 5663	Retail and CPG Supply Chain Management	
SCMT 5683	Supply Chain Management in Global Business	
SCMT 5693	Predictive Supply Chain Analytics	
Finance		
FINN 5173	Energy Finance and Risk Management	
FINN 5303	Advanced Corporate Financial Management	
FINN 4133	Advanced Investments	
	or FINN 541' Shollmier Investment Project	
FINN 5333	Investment Theory and Management	
Innovation/Entrepreneurship		
MGMT 5323	New Venture Development	
MGMT 5413	New Venture Development II	
MGMT 5363	Innovation & Creativity	
Graduate Business Elective		
Professional Development and Internship (6 hours)		
Students must complete the following 3 hours in New Student Orientation:		3
MBAD 5511	Professional Development -- Special Topics In Business	
Students must complete a 3 hour internship:		3
MBAD 535V	MBA Internship	
Total Hours		53

Requirements for Executive M.B.A. Concentration

Executive M.B.A. Website (<https://walton.uark.edu/graduate-programs/executive-mba/>)

Admission to the M.B.A.: Students must be admitted to the Graduate School of Business and to the M.B.A. program by the M.B.A. Admissions Committee. Admission to the M.B.A. program is based upon an acceptable GMAT or GRE score, an acceptable grade-point average, recommendations, essays, and related work experience. For questions regarding admission requirements for the M.B.A. program, please access information online at gsb.uark.edu (<http://gsb.uark.edu>) or contact the Graduate School of Business at gsb@walton.uark.edu.

Prerequisites to Degree Program: Students entering the M.B.A. program are expected to have already mastered basic business concepts or, demonstrated, with an official GMAT or GRE test score, the ability to master business concepts taught in the program. Mastery of the aforementioned topics must be demonstrated before entering the program. Students without academic backgrounds in business may be required to take additional hours or noncredit preparatory classes prior to enrollment in the M.B.A. program.

Requirements for a Master of Business Administration Degree

Requirements include one or more courses from each of the following core areas: People Management, Ethics, and Leadership; Information Technology and Analytics; Accounting and Financial Capital; Marketing and Supply Chain Management; and Strategic and International

Management. In addition, requirements include two to four courses from each concentration's specialization track.

Requirements for the M.B.A. are fulfilled through one of the following three concentrations: Full-Time M.B.A., Executive M.B.A., and Executive Healthcare M.B.A.

Requirements for the Executive M.B.A. Concentration:

Core Courses

People Management, Ethics and Leadership		
MGMT 5613	Leadership and Organizational Behavior	3
Information Technology and Analytics		
SCMT 5133	Quantitative Methods and Decision Making	3
ISYS 5603	Analytics and Visualization	3
Accounting and Financial Capital		
FINN 5113	Corporate Financial Management	3
ACCT 5263	Financial Statement Analysis for Executives	3
Marketing and Supply Chain Management		
MKTG 5223	Marketing	3
SCMT 5663	Retail and CPG Supply Chain Management	3
Strategic and International Management		
MGMT 5313	Strategic Management	3
MGMT 537V	Global Business	3
MGMT 5602	Introduction to Strategy	2
ECON 5253	Economics of Management and Strategy	3
Tracks		6

Executive M.B.A. concentration students must select from one of the following tracks:

Retail		
MKTG 5563	Retail Strategy	
Choose one course from either the Supply Chain Management track or Business Analytics track.		
Supply Chain Management		
SCMT 5683	Supply Chain Management in Global Business	
SCMT 5693	Predictive Supply Chain Analytics	
Financial Management		
FINN 5303	Advanced Corporate Financial Management	
FINN 5333	Investment Theory and Management	
Innovation/Entrepreneurship		
MGMT 5323	New Venture Development	
MGMT 5413	New Venture Development II	
Business Analytics		
ISYS 5833	Data Management Systems	
ISYS 5843	Seminar in Business Intelligence and Knowledge Management	
Total Hours		38

Requirements for Executive Healthcare M.B.A. Concentration

Executive M.B.A. Website (<https://walton.uark.edu/graduate-programs/executive-mba/>)

Admission to the M.B.A.: Students must be admitted to the Graduate School of Business and to the M.B.A. program by the M.B.A. Admissions Committee. Admission to the M.B.A. program is based upon an

acceptable GMAT or GRE score, an acceptable grade-point average, recommendations, essays, and related work experience. For questions regarding admission requirements for the M.B.A. program, please access information online at gsb.uark.edu (<http://gsb.uark.edu>) or contact the Graduate School of Business at gsb@walton.uark.edu.

Prerequisites to Degree Program: Students entering the M.B.A. program are expected to have already mastered basic business concepts or, demonstrated, with an official GMAT or GRE test score, the ability to master business concepts taught in the program. Mastery of the aforementioned topics must be demonstrated before entering the program. Students without academic backgrounds in business may be required to take additional hours or noncredit preparatory classes prior to enrollment in the M.B.A. program.

Requirements for a Master of Business Administration Degree

Requirements include one or more courses from each of the following core areas: People Management, Ethics, and Leadership; Information Technology and Analytics; Accounting and Financial Capital; Marketing and Supply Chain Management; and Strategic and International Management. In addition, requirements include two to four courses from each concentration's specialization track.

Requirements for the M.B.A. are fulfilled through one of the following three concentrations: Full-Time M.B.A., Executive M.B.A., and Executive Healthcare M.B.A.

Requirements for the Executive Healthcare M.B.A. Concentration:

Core Courses

People Management, Ethics and Leadership		
MGMT 5613	Leadership and Organizational Behavior	3
Information Technology and Analytics		
SCMT 5133	Quantitative Methods and Decision Making	3
ISYS 5603	Analytics and Visualization	3
Accounting and Financial Capital		
FINN 5113	Corporate Financial Management	3
ACCT 5263	Financial Statement Analysis for Executives	3
Marketing and Supply Chain Management		
MKTG 5223	Marketing	3
SCMT 5663	Retail and CPG Supply Chain Management	3
Strategic and International Management		
MGMT 5313	Strategic Management	3
MGMT 537V	Global Business	3
MGMT 5602	Introduction to Strategy	2
ECON 5253	Economics of Management and Strategy	3
Public Health Courses		
Executive Healthcare M.B.A. concentration students must also complete the following courses from UAMS:		
PBHL 5123	The Health Care System	3
PBHL 5293	Health Law	3
PBHL 5333	Advanced Health Systems Financial Management	3
PBHL 5533	Health Care Quality Management	3
Total Hours		44

The Sam M. Walton College of Business offers a Ph.D. in Business Administration in six fields of study:

- Accounting (p. 376)
- Finance (p. 391)
- Information Systems (p. 394)
- Management (p. 399)
- Marketing (p. 401)
- Supply Chain Management (p. 406)

Graduate Certificate in Business

The Graduate Certificate in Business is designed to give non-business graduate students a foundation in the core aspects of business they will need to start successful commercial or non-commercial enterprises or assist in creating new products or service offerings in existing organizations. The certificate program is open to all non-business graduate students throughout the University of Arkansas, and students from all majors are encouraged to participate. Ideally, these students will be well-positioned to create knowledge-based, high-growth start-ups or assist existing companies in developing successful new product and services. Both of these goals will contribute to the economic development of the state of Arkansas.

Admission Requirements: The Graduate Certificate in Business is open to all non-business degree-seeking graduate students who are in good standing with the graduate school and admitted to the graduate school of business. Information on graduate school of business admission requirements can be found in the admissions portion of the graduate school of business section of the graduate catalog.

Requirements for the Graduate Certificate in Business: (15 hours)

To receive the Graduate Certificate in Business, students are required to take 9 hours of coursework in the Walton College of Business and 6 hours of electives related to business in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below may be approved by the Director of the Certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

To receive the graduate Certificate in Business, students are required to take 15 hours as follows:

Required Course (no prerequisites)

MGMT 5213	Business Foundations for Entrepreneurs	3
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Choose one of the following classes (one course with prerequisites): 3

MGMT 5223	Business Leadership and Ethics	
MGMT 5313	Strategic Management ((prerequisite – instructor consent))	
MGMT 5323	New Venture Development	
MGMT 5363	Innovation & Creativity	

Choose one of the following classes (no prerequisites): 3

ACCT 5223	MBA Accounting Analysis	
ECON 5243	Managerial Economics	
FINN 5223	Financial Markets & Valuation	
ISYS 5213	ERP Fundamentals	
MKTG 5103	Introduction to Marketing	
SCMT 5633	Introduction to Supply Chain Management	

Electives		6
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Choose 6 hours from any of the following colleges and schools or from Walton College courses already listed above. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Dale Bumpers College of Agricultural, Food and Life Sciences

AGEC 5303	Agricultural Marketing Theory
AGEC 5143	Financial Management in Agriculture
AGEC 5413	Agribusiness Strategy
AMPD 5033	Issues and Trends in Textile Studies
AMPD 5043	Theories and Practices in Apparel Merchandising

J. William Fulbright College of Arts and Sciences

COMM 5403	Organizational Communication Theory
JOUR 5063	Issues in Advertising and Public Relations

College of Education and Health Professions

RESM 5463	Sports Facilities Management
RESM 5843	Tourism

College of Engineering

INEG 4443	Project Management
INEG 5623	Analysis of Inventory Systems

Graduate School

MSEN 5383	Research Commercialization and Product Development
MSEN 5821	Ethics for Scientists and Engineers

Total Hours	15
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Graduate Certificate in Entrepreneurship

The Graduate Certificate in Entrepreneurship is designed to give graduate students a foundation in the core aspects of entrepreneurship they will need to start successful enterprises, to create and promote new products or service offerings in existing organizations, or to engage in social entrepreneurship. The Certificate program is open to all graduate students at the University of Arkansas, and graduate students from all majors are encouraged to participate. Students who complete the Graduate Certificate in Entrepreneurship will have explored the context, tools, and processes of entrepreneurial activity and will have learned how to apply them to commercial and non-commercial enterprises.

Admission Requirements: The Graduate Certificate in Entrepreneurship is open to all graduate students who are in good standing with the graduate school at their campus. Students must apply and be admitted to the Graduate School of Business. Information regarding Graduate School of Business admission requirements can be found earlier in this chapter.

Requirements for the Graduate Certificate in Entrepreneurship: (12 hours) To receive the Graduate Certificate in Entrepreneurship, students are required to take 9 hours of coursework in the Walton College of Business and 3 hours of electives related to entrepreneurship in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below may be approved by the Director of the Certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Required Courses

Choose one of the following:	3
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MGMT 5213	Business Foundations for Entrepreneurs (for non-Business students only)	
MGMT 5313	Strategic Management (required for Business students)	
MGMT 5323	New Venture Development	3
MGMT 5413	New Venture Development II	3

Elective Course

Select one of the following: 3

Dale Bumpers College of Agricultural, Food, and Life Sciences

AGEC 5143	Financial Management in Agriculture
AGEC 5413	Agribusiness Strategy
HDFS 5463	Administration and Leadership in the Helping Professions

J. William Fulbright College of Arts & Sciences

ARTS 596V	Fine Arts Gallery Internship
GDES 594V	Graphic Design Internship
COMM 5403	Organizational Communication Theory
JOUR 5063	Issues in Advertising and Public Relations
JOUR 5323	Documentary Production I

Walton College of Business

MBAD 535V	MBA Internship
MGMT 5993	Entrepreneurship Practicum
MGMT 5363	Innovation & Creativity
MKTG 5433	Consumer and Market Research
MKTG 5553	New Product Development and Strategy

College of Education and Health Professions

RESM 5463	Sports Facilities Management
ATTR 5473	Administration in Athletic Training
RESM 5843	Tourism

College of Engineering

INEG 5453	Systems Engineering and Management
INEG 5463	Project Management
INEG 5623	Analysis of Inventory Systems

Graduate School

MSEN 5383	Research Commercialization and Product Development
MSEN 5821	Ethics for Scientists and Engineers

Total Hours 12

Master of Business Administration Courses**MBAD 5241. Ethical Decision Making. 1 Hour.**

Business Ethics will address business ethics issues from a personal, professional, and organizational perspective. We will cover basic ethical decision-making frameworks to help inform students' personal moral frameworks, ethical issues that are most relevant to managers of modern organizations, and the role of business in society (Typically offered: Fall)

MBAD 535V. MBA Internship. 1-3 Hour.

This course allows a student to experience an internship within a business and benefit from the applied experience. The internship may be designed to offer a wide range of business experiences. The internship must be supervised by a faculty member as well as a member of the firm. MBA Director approval required. (Typically offered: Summer) May be repeated for up to 3 hours of degree credit.

MBAD 5433. Capstone Project. 3 Hours.

A large-scale project integrating various business topics. Prerequisite: MGMT 5313. (Typically offered: Summer)

MBAD 5511. Professional Development -- Special Topics In Business. 1 Hour.

A concentrated emphasis on one business topic. Corequisite: MGMT 5613, ACCT 5263 and ECON 5253. (Typically offered: Fall and Spring) May be repeated for up to 5 hours of degree credit.

Walton College of Business Courses**WCOB 5023. Sustainability in Business. 3 Hours.**

The course focuses on theoretical and practical bases for pursuing sustainability in business and society. (Typically offered: Fall and Spring)

WCOB 510V. Special Topics in Business. 1-3 Hour.

Special business topics of an interdisciplinary nature. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WCOB 5843. Cross-Sector Collaboration for Sustainability. 3 Hours.

This course explores how organizations in the three sectors of society work together in value creation by addressing social and environmental problems. Focusing on business and nonprofit organizations, we investigate the forces that bring about and influence these collaborations from practical and theoretical perspectives, and managerial responses to collaboration challenges. Prerequisite: Graduate Status. (Typically offered: Irregular)

WCOB 6111. Seminar in Business Administration Teaching I. 1 Hour.

This course in college level teaching is designed for graduate students and new college teachers with specific emphasis on the Business Administration learning and classroom management. The purpose of this course is to introduce graduate students to principles of teaching and learning and to prepare these future teachers to lifelong learners in the classroom as teachers. Prerequisite: Graduate standing. (Typically offered: Fall)

Economics (ECON)

Raja Kali
Department Chair
402 Business Building
479-575-ECON (3266)

Gary D. Ferrier
Ph.D. and M.A. Program Director
516 Willard J. Walker Hall
479-575-ECON (3266)

Degrees Conferred:

M.A., Ph.D. (ECON)

Program Description: The skills and knowledge needed in today's economic climate are changing as quickly as technology and practices in the business world. The three degrees offered — a Master of Arts in Economics, a Master of Science in Economic Analytics and the Doctor of Philosophy in Economics — offer exceptional preparation for pursuing an academic career or working in the private or public sectors. This innovative program combines the study of economic theory and applied econometrics to provide rigorous training and preparation for your chosen career.

M.A. in Economics

Prerequisites to Degree Program: Applicants for graduate studies in economics must meet the requirements of the Graduate School of Business and be accepted by the Department of Economics. The requirements are (1) a bachelor's degree from an accredited institution with a satisfactory grade-point average, (2) a satisfactory score on the

Graduate Record Examinations (GRE), and (3) satisfactory performance in the following courses: intermediate microeconomics, intermediate macroeconomics, statistics, two semesters of calculus, and linear algebra. Students from all academic backgrounds are encouraged to apply.

Degree Options: Students must select the Non-Thesis or Thesis option. Both options combine a study of economic theory, applied econometrics, and an applied field that will prepare students for careers in the private or public sector, or for doctoral programs. The Non-Thesis option can be completed in one year. The Thesis option is for students who seek more advanced skills. It requires additional coursework and a thesis, and will take three or four semesters to complete.

Common Requirements for the Master of Arts Degree, Non-Thesis and Thesis Options: All master's students must satisfactorily complete the 30 hours of course work listed below. Students must have a 3.00 cumulative grade point average in order to graduate. If at any point, a student's cumulative GPA falls below a 3.00, the student will be placed on academic probation. A student with a cumulative GPA below 3.00 for two consecutive semesters will be dismissed from the program.

Core Requirements

ECON 6133	Mathematics for Economic Analysis	3
ECON 6213	Microeconomic Theory I	3
ECON 6223	Microeconomic Theory II	3
ECON 6313	Macroeconomic Theory I	3
ECON 6323	Macroeconomic Theory II	3
ECON 6613	Econometrics I	3
ECON 6623	Econometrics II	3
or ECON 6633	Econometrics III	
ECON 643V	Seminar in Economic Theory and Research I	1-3
ECON 644V	Seminar in Economic Theory and Research II	1-3
Total Hours		23-27

Applied Field Concentration (6 hours): Each student shall complete at least six hours of coursework in one applied field. Students who seek advanced training in applied economics and business in preparation for entering business or government employment should select one of the following fields: finance, accounting, marketing, transportation, information systems, or quantitative methods. Students who plan to enter a doctoral program should choose mathematics or statistics as their field. Other concentrations are possible with the approval of the Program Coordinator.

Graduate Seminar (3 hours): Students must register for at least one hour of graduate seminar each semester they are in residence.

Additional Degree Requirements, Non-Thesis Option (30 hours): In addition to 30 hours of required coursework, students who select the non-thesis option must take a comprehensive exam. Students must pass written exams in microeconomics and macroeconomics. The final exams at the end of ECON 6223 Microeconomic Theory II and ECON 6323 Macroeconomic Theory II will be comprehensive over both Micro I & II and Macro I & II. These two exams will be taken by all students in the course and will serve as the comprehensive exam for master's students. Each exam has three possible grades: Pass, Marginal Pass, and Fail. Students must earn at least a Marginal Pass on both exams.

Should a Ph.D. student later decide to receive the master's degree, the master's comprehensive examination requirement will have been satisfied if the student received at least a Marginal Pass on both exams. These exams will be developed and graded by the instructor of record for the

courses. In cases where a student's performance might produce a "Fail," the instructor will consult with the faculty who normally develop the Ph.D. preliminary examination in that area.

Additional Degree Requirements, Thesis Option (Minimum of 42 hours): This option is intended for students who seek the acquisition of advanced analytical and research skills. Students who select the Thesis option must pass 30 hours of required coursework specified above, 12 additional hours of coursework – 6 hours approved by the Program Director and 6 hours of thesis credit, and pass a comprehensive exam. The comprehensive exam will take the form of a formal thesis defense.

Ph.D. in Economics

Prerequisites to Degree Program: Students may enter the program directly from a bachelor's degree or a master's degree program. Applicants for graduate studies in economics must meet the requirements of the Graduate School of Business and be accepted by the Department of Economics. The requirements are (1) a bachelor's degree from an accredited institution with a satisfactory grade-point average, (2) a satisfactory score on the Graduate Record Examinations (GRE), and (3) satisfactory performance in the following courses: intermediate microeconomics, intermediate macroeconomics, statistics, two semesters of calculus, and linear algebra. Students from all academic backgrounds are encouraged to apply.

All doctoral students must satisfactorily complete the 72 hours of required courses including a graduate seminar each semester they are on graduate assistantships.

Required Courses

ECON 6133	Mathematics for Economic Analysis	3
ECON 6213	Microeconomic Theory I	3
ECON 6223	Microeconomic Theory II	3
ECON 6313	Macroeconomic Theory I	3
ECON 6323	Macroeconomic Theory II	3
ECON 6613	Econometrics I	3
ECON 6623	Econometrics II	3
ECON 6633	Econometrics III	3
ECON 6713	Industrial Organization I	3
ECON 6723	Industrial Organization II	3
ECON 6833	International Trade and Development I	3
ECON 6843	International Trade and Development II	3
ECON 6913	Experimental Economics	3
WCOB 6111	Seminar in Business Administration Teaching I	1

Students on assistantship must enroll in WCOB 6111. Other students may enroll in an additional hour of ECON 643V or ECON 644V in lieu of WCOB 6111

Research Requirements

Students must register for at least one hour of graduate seminar (ECON 643V/ECON 644V) each semester they are in residence and for three hours of ECON 643V the summer following their first year in the program

ECON 636V	Special Problems in Economics	3
ECON 643V	Seminar in Economic Theory and Research I	7
ECON 644V	Seminar in Economic Theory and Research II	4

Dissertation Hours (see the explanation below)

ECON 700V	Doctoral Dissertation	18
Total Hours		72

Candidacy Examinations

All students must pass a Candidacy Exam, which consists of two components.

The first component entails written Comprehensive Examinations in microeconomics and macroeconomics. These exams will normally be taken in the summer after a student's first year in the program. Each exam has three possible grades: Pass, Marginal Pass, and Fail. Students must earn a Pass on one of the exams and at least a Marginal Pass on the other exam. A student will normally have two opportunities to pass each Comprehensive Examination, with the second opportunity typically occurring in that January following the first attempt. If a student's exam scores are not satisfactory, all exams for which a grade of Pass was not earned must be retaken. Only the most recent grade will be used in determining if this requirement has been met. Failure to successfully complete this requirement will result in a student being dismissed from the program.

The second component is a Field Examination. Students complete two fields of study within economics, which will normally be a) Industrial Organization and b) International Macroeconomics and Development. Other fields are possible with the approval of the Director of Graduate Studies. A field will consist of 6 hours of specialized courses (numbered 6000 or above). Students will select one of their two fields as a major field and must pass a Field Exam in that area. The Field Exam requirement is satisfied by a research paper on a topic in the student's field of specialization. The paper is to be completed by the end of the summer following the student's second year during which the student completes the required field courses. The field paper topic must be approved by the student's advisor and registered with the Director of Graduate Studies. The Field Examination is satisfactorily fulfilled when the student's adviser approves the completed paper. When feasible, the paper will be presented at a departmental seminar before it is approved by the student's adviser or soon after. Failure to successfully complete this requirement will result in a student being dismissed from the program.

After passing the Candidacy Examination, doctoral students are required to be enrolled in a minimum of one hour of graded graduate coursework or dissertation credit each semester (Fall and Spring) while on graduate assistantship.

Dissertation

The dissertation demonstrates a student's ability to select, define, organize, and complete a major research project. It should validate that the student has technical mastery of the field, is capable of doing independent scholarly research, and is able to formulate conclusions that enlarge the body of economic knowledge. Dissertation requirements include (1) a defense of proposal and (2) completion of an acceptable doctoral dissertation. Students must enroll in a total of 18 hours of dissertation credit.

Final Examination

The final examination is normally an oral defense of the student's dissertation.

Graduate Faculty

Balthrop, Andrew, Ph.D. (Georgia State University), Visiting Assistant Professor, 2017.

Bhattacharya, Puja, Ph.D., M.A. (Ohio State University), M.S. (Indian Statistical Institute), B.S. (Presidency College), Assistant Professor, 2019.

Brownback, Andrew P., Ph.D. (University of California, San Diego), B.A. (Kansas State University), Assistant Professor, 2015.

Cawthon, W. Michael, M.S. (University of Chicago), Lecturer, 2019.

Civelli, Andrea, Ph.D., M.A. (Princeton University), B.A. (Bocconi University, Milan), Associate Professor, 2010.

Embaye, Abel, Ph.D. (Georgia State University), M.A. (Tilburg University), B.A. (University of Asmara), Clinical Assistant Professor, 2010.

Farmer, Amy Lynn, Ph.D., M.A. (Duke University), B.S. (Purdue University), University Professor, 1999.

Ferrier, Gary D., Ph.D. (University of North Carolina–Chapel Hill), B.A. (University of Wisconsin–Madison), University Professor, 1993.

Gaduh, Arya, Ph.D. (University of Southern California), M.Phil. (Cambridge University), B.A. (University of California–Berkeley), Associate Professor, 2013.

Geng, Difei, Ph.D. (Vanderbilt University), M.A. (Southern Methodist University), M.A. (Nankai University), B.A. (Tianjin University of Finance and Economics), Assistant Professor, 2016.

Gu, Jingping, Ph.D. (Texas A&M University), M.A. (Peking University), B.A. (Renmin University of China, Beijing), Associate Professor, 2008.

Horowitz, Andrew W., Ph.D., M.S. (University of Wisconsin–Madison), B.S. (University of Maryland), Professor, 1998.

Jung, Hyunseok, Ph.D. (Syracuse University), M.A. (Korea Development Institute), B.A. (Seoul National University), Assistant Professor, 2018.

Kali, Raja, Ph.D., M.A. (University of Maryland University College), B.S.C. (University of Calcutta), Professor, 1999.

Koh, Dongy, Ph.D. (Washington University–St. Louis), M.A. (Boston University), B.A. (Keio University), Assistant Professor, 2014.

Li, Xin 'Sherry', Ph.D. (University of Michigan), M.A. (Syracuse University), M.A., B.A. (Renmin People's University of China), Professor, 2018.

McGee, Peter J., Ph.D. (Ohio State University), B.S. (Tulane University), Associate Professor, 2014.

Park, Doyoung, Ph.D. (University of Colorado), Assistant Professor, 2019.

Sheets, Ryan, Ph.D. (University of Illinois at Urbana–Champaign), Instructor, 2019.

Stapp, Robert Bruce, Ph.D., M.S. (Oklahoma State University), B.S.B.A. (Oklahoma City University), Clinical Professor, 1995.

Courses

ECON 5243. Managerial Economics. 3 Hours.

This course will provide students with a strong foundation in core economics principles, with emphasis on industrial organization issues and applications geared toward the supply-chain and retail focus of the redesigned MBA program. (Typically offered: Fall and Spring)

ECON 5253. Economics of Management and Strategy. 3 Hours.

Information economics and applied game theory. (Typically offered: Irregular)

ECON 5263. Applied Microeconomics. 3 Hours.

The framework for this course is the economic way of thinking. Both the theory and application of important economics questions are presented, showing students the applicability of various economic methodologies in a number of different contexts. To gain competence in the applied side of economic analysis, students will use MS Excel or other software to apply class concepts to solve concrete problems. Prerequisite: ECON 5243 and (ECON 5743 or AGECE 5613). (Typically offered: Spring)

ECON 537V. Global Business. 1-3 Hour.

Integrated overview of the global business environment and the organizational challenges of a multinational firm. To enhance understanding of the business and cultural environment of prominent emerging markets, the course includes a 2-3 week overseas immersion project to fulfill a predefined goal. Project is integrated with global content upon return. (Typically offered: Fall and Spring)
This course is cross-listed with MGMT 537V.

ECON 5423. Behavioral Economics. 3 Hours.

(Formerly ECON 4423.) Both economics and psychology systematically study human judgment, behavior, and well-being. This course surveys attempts to incorporate psychology into economics to better understand how people make decisions in economic situations. The course will cover models of choice under uncertainty, choice over time, as well as procedural theories of decision making. Graduate degree credit will not be given for both ECON 4423 and ECON 5423. Prerequisite: ECON 2023 or ECON 2143. (Typically offered: Spring)

ECON 5433. Experimental Economics. 3 Hours.

(Formerly ECON 4433.) The course offers an introduction to the field of experimental economics. Included are the methodological issues associated with developing, conducting, and analyzing controlled laboratory experiments. Standard behavioral results are examined and the implications of such behavior for business and economic theory are explored. Graduate degree credit will not be given for both ECON 4433 and ECON 5433. Prerequisite: ECON 2023 or ECON 2143. (Typically offered: Fall)

ECON 5743. Introduction to Econometrics. 3 Hours.

(Formerly ECON 4743.) Introduction to the application of statistical methods to problems in economics. Graduate degree credit will not be given for both ECON 4743 and ECON 5743. Prerequisite: ((ECON 2013 and ECON 2023) or ECON 2143) and ((MATH 2043 or MATH 2554 or higher)) and (WCOB 1033 or STAT 2303). (Typically offered: Spring)

ECON 5753. Forecasting. 3 Hours.

(Formerly ECON 4753.) The application of forecasting methods to economics, management, engineering, and other natural and social sciences. The student will learn how to recognize important features of time series and will be able to estimate and evaluate econometric models that fit the data reasonably well and allow the construction of forecasts. Graduate degree credit will not be given for both ECON 4753 and ECON 5753. Prerequisite: (ECON 2013 and ECON 2023) or (ECON 2143) and (MATH 2043 or MATH 2554) and (WCOB 1033 or STAT 2303). (Typically offered: Fall)

ECON 5763. Economic Analytics. 3 Hours.

This course provides students with a good overview of modern big data methods, including Machine Learning, along with hands-on experience of in-depth analytics projects using real data. After 3 weeks of introductory lectures on the big data methods by the instructor, students will form groups and propose research projects they will develop over the semester. Knowledge of some statistical software is recommended, including Python, R and MATLAB. Prerequisite: (ECON 5743 or AGECE 5613) and ECON 5783. (Typically offered: Spring)

ECON 5783. Applied Microeconometrics. 3 Hours.

This course covers the principles of causal inference. Methods include panel data models, instrumental variables, regression discontinuity designs, difference-in-differences, and matching. Emphasis on developing a solid understanding of the underlying econometric principles of the methods taught as well as on their empirical application. Prerequisite: ECON 5743 or AGECE 5613. (Typically offered: Fall)

ECON 5853. International Economics Policy. 3 Hours.

An intensive analysis of the operation of the international economy with emphasis on issues of current policy interest. (Typically offered: Irregular)

ECON 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ECON 6133. Mathematics for Economic Analysis. 3 Hours.

This course will develop mathematical and statistical skills for learning economics and related fields. Topics include calculus, static optimization, real analysis, linear algebra, convex analysis, and dynamic optimization. Prerequisite: Graduate standing and MATH 2554 or equivalent. (Typically offered: Summer)

ECON 6213. Microeconomic Theory I. 3 Hours.

Introductory microeconomic theory at the graduate level. Mathematical formulation of the consumer choice, producer behavior, and market equilibrium problems at the level of introductory calculus. Discussion of monopoly, oligopoly, public goods, and externalities. (Typically offered: Fall)

ECON 6223. Microeconomic Theory II. 3 Hours.

Advanced treatment of the central microeconomic issues using basic real analysis. Formal discussion of duality, general equilibrium, welfare economics, choice under uncertainty, and game theory. (Typically offered: Spring)

ECON 6313. Macroeconomic Theory I. 3 Hours.

Theoretical development of macroeconomic models that include and explain the natural rate of unemployment hypothesis and rational expectations, consumer behavior, demand for money, market clearing models, investment, and fiscal policy. (Typically offered: Fall)

ECON 6323. Macroeconomic Theory II. 3 Hours.

Further development of macroeconomic models to include uncertainty and asset pricing theory. Application of macroeconomic models to explain real world situations. (Typically offered: Spring)

ECON 636V. Special Problems in Economics. 1-6 Hour.

Independent reading and investigation in economics. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

ECON 643V. Seminar in Economic Theory and Research I. 1-3 Hour.

Seminar. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

ECON 644V. Seminar in Economic Theory and Research II. 1-3 Hour.

Independent research and group discussion. (Typically offered: Spring)

ECON 6543. Seminar in Advanced Economics II. 3 Hours.

This seminar will cover advanced fields of current research importance in economics. This will facilitate the development of research directions for doctoral study and research. Prerequisite: Graduate standing. (Typically offered: Irregular)

ECON 6613. Econometrics I. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. The single equation model is examined emphasizing multicollinearity, autocorrelation, heteroskedasticity, binary variables and distributed lags. Prerequisite: MATH 2043 and knowledge of matrix methods, which may be acquired as a corequisite, and ECON 2023, and an introductory statistics course or equivalent. (Typically offered: Fall)

ECON 6623. Econometrics II. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. The treatment of measurement error and limited dependent variables and the estimation of multiple equation models and basic panel data models will be covered. Additional frontier techniques may be introduced. Prerequisite: ECON 6613. (Typically offered: Spring)

ECON 6633. Econometrics III. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. Nonlinear and semiparametric/nonparametric methods, dynamic panel data methods, and time series analysis (both stationary and nonstationary processes) will be covered. Additional frontier techniques may be covered. Prerequisite: ECON 6613. (Typically offered: Spring)

ECON 6713. Industrial Organization I. 3 Hours.

This course will develop the theory of modern industrial organization. The latest advances in microeconomic theory, including game theory, information economics and auction theory will be applied to understand the behavior and organization of firms and industries. Theory will be combined with empirical evidence on firms, industries and markets. Prerequisite: ECON 6213 and ECON 6223. (Typically offered: Fall)

ECON 6723. Industrial Organization II. 3 Hours.

This course surveys firm decisions, including setting prices, choosing product lines and product quality, employing price discrimination, and taking advantage of market structure. It will also cover behavioral IO, which reconsiders the assumption that firms and consumers are perfectly rational and examines the role of regulation. Prerequisite: ECON 6133. (Typically offered: Spring)

ECON 6833. International Trade and Development I. 3 Hours.

A first graduate level course in development economics with a focus on foundational theoretical issues. We explore the causation, implications, and remedies for pervasive and persistent poverty in low-income countries. Emphasis will be primarily on microeconomics topics. May be taken either as a precursor to International Development Economics II or stand-alone. Prerequisite: ECON 6213, (ECON 6613 or AGECE 5613) or by instructor's permission. (Typically offered: Fall)

ECON 6843. International Trade and Development II. 3 Hours.

A second graduate level course in development economics that focuses on the empirical aspect of development in low-income countries. The course explores various microeconomics topics related to poverty, human capital accumulation, and their interactions with role of public policy. Prerequisite: ECON 6213, (ECON 6613 or AGECE 5613) or instructor consent. (Typically offered: Spring)

ECON 6913. Experimental Economics. 3 Hours.

The course develops advanced concepts in the use of controlled experiments to test economic theory and explore behavioral regularities relating to economics. The class focuses on the methodology of experimental economics while reviewing a variety of established results. Prerequisite: ECON 6213. (Typically offered: Fall)

ECON 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Economic Analytics (ECAN)

Gary Ferrier
Program Director
517 Willard Walker Hall
gferrier@walton.uark.edu

Master of Science in Economic Analytics Website (<https://walton.uark.edu/graduate-programs/economic-analytics-masters-degree/>)

Degrees Conferred:

M.S. in Economic Analytics (ECAN)

The Master of Science in Economic Analytics is an intensive program that will guide students through economic modeling and theory to computational practice and cutting-edge tools, providing a thorough training in descriptive, predictive, and prescriptive analytics. Students will be armed with a solid knowledge of econometric and machine learning methods, optimization, and computing. These "big-data" skills, combined with knowledge of economic modeling, will enable them to identify, assess, and seize the opportunity for data-driven value creation in the private and public sector.

Upon successful completion of the program, students will be eligible to receive an Enterprise Systems Graduate Certificate (p. 370) (Business Analytics Concentration) in addition to the M.S. in Economic Analytics

degree. Students must separately apply for the certificate prior to degree conferral.

Requirements for M.S. in Economic Analytics

Prerequisites to Degree Program

Students entering the M.S. in Economic Analytics program are expected to have already mastered basic economic concepts or, demonstrated, with an official GMAT or GRE test score, the ability to master economic concepts taught in the program. Students without academic backgrounds in economics may be required to take additional hours or noncredit preparatory classes prior to enrollment in the M.S. program. International applicants must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis. Students from all academic backgrounds are encouraged to apply.

Requirements for the Master of Science Degree

Requirements include one or more courses from each of the following core areas: Data Management, Economic Models, Econometrics and Data Science, and Communication and Professional Development.

Students whose previous studies or experience indicate mastery of basic economic concepts must satisfactorily complete the 30 hours of course work listed below.

ECON 5243	Managerial Economics	3
ECON 5263	Applied Microeconomics	3
ECON 5743	Introduction to Econometrics	3
ECON 5753	Forecasting	3
ECON 5763	Economic Analytics	3
ECON 5783	Applied Microeconometrics	3
ECON 636V	Special Problems in Economics	3
ISYS 5103	Data Analytics Fundamentals	3
ISYS 5833	Data Management Systems	3
ISYS 5843	Seminar in Business Intelligence and Knowledge Management	3
Total Hours		30

Additional Degree Requirements, Non-Thesis Option

In addition to 30 hours of required coursework, students must take a comprehensive exam. The comprehensive exam will take the form of the final project in ECON 5763 Economic Analytics (tools and project). An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Finance (FINN)

Pu Liu
Department Chair
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Wayne Y. Lee
Ph.D. Program Director
M.S. in Finance Program Coordinator
473 Business Building
wlee@walton.uark.edu

Degrees Conferred:

M.S. in Finance (FINN)

Ph.D. in Business Administration (BADM)

Master's Program Description: The Master of Science in Finance is designed for early- to mid-career students who seek advanced education in Finance. Effective financial management requires cross-functional expertise and focus. In addition to the core, the program includes courses from related disciplines that allow students to specialize in one of four concentrations: Business Analytics; Digital Technology; Energy Finance and Risk Management; and Supply Chain Management.

Ph.D. Program Description: The Ph.D. program in Business Administration with an area of study in Finance prepares students for faculty positions at academic institutions or for professional careers in private industry and government. During their course of study, students receive specialized instruction in the areas of corporate finance, investments, and financial institutions. The conceptual knowledge and methodological skills necessary to conduct independent research are acquired through courses and individual apprenticeships with faculty.

Requirements for M.S. in Finance with Business Analytics Concentration

Master of Science in Finance Website (<https://walton.uark.edu/graduate-programs/finance-masters-degree/>)

Admission Requirements: The Master of Science in Finance program is open to students who earned a bachelor's or master's degree from an accredited institution and can present evidence of their ability to do graduate work, including significant GPA, GMAT or GRE test scores, and recommendations. International students must submit an acceptable TOEFL or IELTS scores or complete the Intensive English Language Program (Spring International Language Center) and demonstrate English proficiency. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Science in Finance from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses (21 hours)

FINN 5223	Financial Markets & Valuation	3
FINN 5303	Advanced Corporate Financial Management	3
FINN 5313	Advanced Commercial Banking	3
FINN 5333	Investment Theory and Management	3
FINN 541V	Shollmier Investment Project	3
ACCT 5223	MBA Accounting Analysis	3
Choose one of the following:		3
ACCT 5463	Financial Statement Analysis	
ACCT 5523	Advanced Accounting Information Systems	
ECON 5243	Managerial Economics	
ISYS 5103	Data Analytics Fundamentals	
Areas of Concentration		9
Total Hours		30

With the approval of the Master of Science in Finance Program Director, any senior-level (4000+) course may be taken for graduate credit. After admission, the student must maintain a 3.0 grade-point average on all finance and graduate coursework with a grade of 'B' or better in 75% of courses attempted. Proposed changes in elective coursework can be

made by students in consultation with and subject to the approval of the Master of Science in Finance Director.

Master of Science in Finance (Part-Time): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester over 5 semesters. Approval of the Master of Science in Finance Program Director is required to enroll in more than six credit hours per semester.

Finance and Business Analytics Concentration

Choose three courses from the following:		9
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5133	Blockchain and E Business Development	
ISYS 5173	Blockchain Fundamentals	
ISYS 5453	Blockchain and Enterprise Data	

¹ Option to take ISYS 5103 Data Analytics Fundamentals as part of the core. Completing the Finance and Business Analytics concentration will make students eligible for the Enterprise Systems Graduate Certificate; Business Analytics Track.

Requirements for M.S. in Finance with Digital Technology Concentration

Master of Science in Finance Website (<https://walton.uark.edu/graduate-programs/finance-masters-degree/>)

Admission Requirements: The Master of Science in Finance program is open to students who earned a bachelor's or master's degree from an accredited institution and can present evidence of their ability to do graduate work, including significant GPA, GMAT or GRE test scores, and recommendations. International students must submit an acceptable TOEFL or IELTS scores or complete the Intensive English Language Program (Spring International Language Center) and demonstrate English proficiency. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Science in Finance from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses (21 hours)

FINN 5223	Financial Markets & Valuation	3
FINN 5303	Advanced Corporate Financial Management	3
FINN 5313	Advanced Commercial Banking	3
FINN 5333	Investment Theory and Management	3
FINN 541V	Shollmier Investment Project	3
ACCT 5223	MBA Accounting Analysis	3
Choose one of the following:		3
ACCT 5463	Financial Statement Analysis	
ACCT 5523	Advanced Accounting Information Systems	
ECON 5243	Managerial Economics	
ISYS 5103	Data Analytics Fundamentals	
Areas of Concentration		9
Total Hours		30

With the approval of the Master of Science in Finance Program Director, any senior-level (4000+) course may be taken for graduate credit. After admission, the student must maintain a 3.0 grade-point average on all finance and graduate coursework with a grade of 'B' or better in 75% of courses attempted. Proposed changes in elective coursework can be

made by students in consultation with and subject to the approval of the Master of Science in Finance Director.

Master of Science in Finance (Part-Time): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester over 5 semesters. Approval of the Master of Science in Finance Program Director is required to enroll in more than six credit hours per semester.

Finance and Digital Technology Concentration

Students should select 9 hours from the following list of courses:	9
ISYS 5103 Data Analytics Fundamentals ¹	
ISYS 5133 Blockchain and E Business Development	
ISYS 5173 Blockchain Fundamentals	
ISYS 5453 Blockchain and Enterprise Data	
Total Hours	9

¹ Option to take ISYS 5103 Data Analytics Fundamentals as part of the core. Completing the Finance and Digital Technology concentration will make students eligible for the Enterprise Systems Graduate Certificate; Blockchain Enterprise Systems Track.

Requirements for M.S. in Finance with Energy Finance and Risk Management Concentration

Master of Science in Finance Website (<https://walton.uark.edu/graduate-programs/finance-masters-degree/>)

Admission Requirements: The Master of Science in Finance program is open to students who earned a bachelor's or master's degree from an accredited institution and can present evidence of their ability to do graduate work, including significant GPA, GMAT or GRE test scores, and recommendations. International students must submit an acceptable TOEFL or IELTS scores or complete the Intensive English Language Program (Spring International Language Center) and demonstrate English proficiency. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Science in Finance from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses (21 hours)

FINN 5223 Financial Markets & Valuation	3
FINN 5303 Advanced Corporate Financial Management	3
FINN 5313 Advanced Commercial Banking	3
FINN 5333 Investment Theory and Management	3
FINN 541V Shollmier Investment Project	3
ACCT 5223 MBA Accounting Analysis	3
Choose one of the following:	3
ACCT 5463 Financial Statement Analysis	
ACCT 5523 Advanced Accounting Information Systems	
ECON 5243 Managerial Economics	
ISYS 5103 Data Analytics Fundamentals	
Areas of Concentration	9
Total Hours	30

With the approval of the Master of Science in Finance Program Director, any senior-level (4000+) course may be taken for graduate credit. After admission, the student must maintain a 3.0 grade-point average on all finance and graduate coursework with a grade of 'B' or better in 75% of courses attempted. Proposed changes in elective coursework can be

made by students in consultation with and subject to the approval of the Master of Science in Finance Director.

Master of Science in Finance (Part-Time): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester over 5 semesters. Approval of the Master of Science in Finance Program Director is required to enroll in more than six credit hours per semester.

Energy Finance and Risk Management Concentration

ACCT 5993 Energy Accounting	3
FINN 5173 Energy Finance and Risk Management	3
FINN 510V Special Topics in Finance	3
Total Hours	9

Students are encouraged to take GARP's Energy Risk Professional (ERP) certification program.

Requirements for M.S. in Finance with Supply Chain Management Concentration

Master of Science in Finance Website (<https://walton.uark.edu/graduate-programs/finance-masters-degree/>)

Admission Requirements: The Master of Science in Finance program is open to students who earned a bachelor's or master's degree from an accredited institution and can present evidence of their ability to do graduate work, including significant GPA, GMAT or GRE test scores, and recommendations. International students must submit an acceptable TOEFL or IELTS scores or complete the Intensive English Language Program (Spring International Language Center) and demonstrate English proficiency. The degree program does not require a thesis or comprehensive exam. Successful completion of a Master of Science in Finance from the University of Arkansas will qualify a student to take relevant professional examinations.

Core Courses (21 hours)

FINN 5223 Financial Markets & Valuation	3
FINN 5303 Advanced Corporate Financial Management	3
FINN 5313 Advanced Commercial Banking	3
FINN 5333 Investment Theory and Management	3
FINN 541V Shollmier Investment Project	3
ACCT 5223 MBA Accounting Analysis	3
Choose one of the following:	3
ACCT 5463 Financial Statement Analysis	
ACCT 5523 Advanced Accounting Information Systems	
ECON 5243 Managerial Economics	
ISYS 5103 Data Analytics Fundamentals	
Areas of Concentration	9
Total Hours	30

With the approval of the Master of Science in Finance Program Director, any senior-level (4000+) course may be taken for graduate credit. After admission, the student must maintain a 3.0 grade-point average on all finance and graduate coursework with a grade of 'B' or better in 75% of courses attempted. Proposed changes in elective coursework can be made by students in consultation with and subject to the approval of the Master of Science in Finance Director.

Master of Science in Finance (Part-Time): The Walton College also provides an opportunity for professionals in the workplace to complete the

program by taking 6 hours per semester over 5 semesters. Approval of the Master of Science in Finance Program Director is required to enroll in more than six credit hours per semester.

Finance and Supply Chain Management Concentration

Students should select 9 hours from the following list of courses:	9
SCMT 5623	Supply Chain Innovation and Technology
SCMT 5633	Introduction to Supply Chain Management
SCMT 5663	Retail and CPG Supply Chain Management
SCMT 5683	Supply Chain Management in Global Business ¹
SCMT 5693	Predictive Supply Chain Analytics

¹ Prerequisite for SCMT 5683 is SCMT 5663.

Ph.D. in Business Administration (Finance)

Program Requirements:

The Ph.D. program in Finance requires 43 credit hours of coursework. Five seminars (15 credit hours) in financial theory and research are required in addition to 1 hour of WCOB 6111 Seminar in Business Administration Teaching I. The remaining credit hours, distributed across two supporting areas, economics and research, are customized in consultation with the department doctoral program adviser along with 18 hours of dissertation. In addition, students must complete a research paper requirement, pass a written and an oral comprehensive exam, as well as successfully defend a dissertation.

Required Courses (34 hours)

WCOB 6111	Seminar in Business Administration Teaching I	1
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Finance

FINN 6043	Finance Theory	3
FINN 6133	Seminar in Investment Theory	3
FINN 6233	Seminar in Financial Management	3
FINN 6333	Empirical Research in Finance	3
FINN 6733	Seminar in Financial Markets and Institutions	3

Economics

ECON 6133	Mathematics for Economic Analysis	
ECON 6213	Microeconomic Theory I	
ECON 6223	Microeconomic Theory II	
ECON 6613	Econometrics I	
ECON 6623	Econometrics II	3
ECON 6633	Econometrics III	3

Research Requirements (9 hours)

Students may take up to one research tool course approved by the department doctoral program adviser when the research tool course is not listed above.

FINN 683V	Contemporary Issues in Doctoral Colloquium	3
Select two of the following:		6

STAT 5103	Introduction to Probability Theory	
STAT 5113	Statistical Inference	
STAT 5353	Methods of Multivariate Analysis	
STAT 5333	Analysis of Categorical Responses	
STAT 5383	Time Series Analysis	
STAT 5413	Spatial Statistics	

Dissertation		18
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Total Hours		49
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Candidacy Exam

The comprehensive exam has written and oral elements. The written segment consists of two questions from each of the five doctoral seminars. Students must answer a total of seven questions with at least one question from each of the five doctoral seminars. Contingent on satisfactory performance on the written exam, students progress to the oral segment. In the oral segment, students are asked to clarify and/or expand on their answers to questions on the written exam. Students can also be asked to address questions on the written exam which were not selected. Students who successfully pass the comprehensive exam advance to the dissertation stage.

Students must complete a minimum of 72 graduate credit hours beyond the bachelor's degree and 42 graduate credit hours beyond the master's degree. For students who apply to the degree program without a master's degree, a minimum of 11 additional credit hours in consultation with the department doctoral program adviser will be required to fulfill the full degree requirements to include approved graduate courses or a Master of Arts in Economics. Additional hours may be assessed in individual cases to meet specific coursework deficiencies.

Go to a complete list of the university's Graduate School degree requirements (p. 424).

Graduate Faculty

Acrey, Cash, Ph.D., M.B.A. (University of Arkansas), B.A. (University of Arkansas at Little Rock), Clinical Assistant Professor, 2013.

Dominick, John Andrew, Ph.D., M.S. (University of Alabama), B.S.B.A. (Louisiana Polytechnic Institute), Professor, 1970.

Hsu, Hung-Chia Scott, Ph.D. (University of North Carolina-Chapel Hill), M.A. (University of Southern California), B.A. (National Taiwan University), Assistant Professor, 2015.

Jandik, Tomas, Ph.D. (University of Pittsburgh), M.S., B.S. (Czech Technical University), Professor, 2000.

Lee, Wayne Y., Ph.D. (University of California-Los Angeles), M.B.A. (Santa Clara University), B.S.M.E. (De La Salle College, Philippines), Professor, 1998.

Liu, Pu, Ph.D., M.B.A. (Indiana University at Bloomington), B.S. (National Cheng Kung University), Professor, 1984.

Malakhov, Alexey, Ph.D. (Northwestern University), Ph.D. (University of North Carolina at Charlotte), M.S. (Moscow State University), Associate Professor, 2006.

Rennie, Craig, Ph.D. (University of Oregon), M.B.A. (Dalhousie University), B.A. (University of Toronto), Associate Professor, 2001.

Riley, Timothy B., Ph.D., M.B.A., B.S.S. (University of Kentucky), Assistant Professor, 2016.

Risk, Mark E., M.B.A., B.S.B.A. (University of Arkansas), Instructor, 1981.

Sirmans, Corbitt Stace, Ph.D., B.S. (Florida State University), Assistant Professor, 2014.

Yeager, Timothy J., Ph.D., M.A. (Washington University in St. Louis), Professor, 2006.

Courses

FINN 510V. Special Topics in Finance. 1-3 Hour.

This course focuses on advanced energy risk management strategies and tactics commonly applied by regional, national, and multi-national energy firms, including upstream, midstream, and downstream oil and gas companies, and by firms and other participants in the electricity industry. Contemporary issues related to energy, fracking, conflict, technological innovation, and the future of the energy industry will be covered. Topics include financial statement analysis and valuation of energy companies, commodity trading and risk management, forwards, futures, options, and swaps, and hedging. Fundamental credit risk analysis and risk exposure, counterparty risk, risk mitigation techniques, and country risk are also covered. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

FINN 5113. Corporate Financial Management. 3 Hours.

Financial analysis, planning and control; decision making and modeling for financial managers; and financial policies for management. (Typically offered: Spring)

FINN 5133. Advanced Investments. 3 Hours.

(Formerly FINN 4133.) Sound training in the principles of security analysis and portfolio management and certain advanced techniques of financial management. Modern portfolio theory and its application to portfolio management practices will be emphasized. Graduate degree credit will not be given for both FINN 4133 and FINN 5133. Prerequisite: FINN 3063. (Typically offered: Fall and Spring)

FINN 5173. Energy Finance and Risk Management. 3 Hours.

This course provides an advanced introduction to energy finance, defined as the application of finance principles to energy, energy service, and related industries, concerning all aspects of the energy value chain. Topics include: (1) physical fossil fuel markets; (2) physical electricity markets; (3) financially traded energy products; and (4) credit, counterpart, country, and enterprise risk. It also introduces students to business valuation and investment banking applications in the energy industry vertical. Prerequisite: FINN 5113 or FINN 5223. (Typically offered: Fall)

FINN 5223. Financial Markets & Valuation. 3 Hours.

Analysis of financial information by capital markets in the determination of security values with specific applications to retail and logistics companies. This course views these and other companies from the point of view of the capital markets. (Typically offered: Spring) May be repeated for degree credit.

FINN 5233. Advanced Corporate Finance. 3 Hours.

(Formerly FINN 4233.) Addresses complex and multifaceted issues and problems in financial decision-making. Graduate degree credit will not be given for both FINN 4233 and FINN 5233. Prerequisite: FINN 3603. (Typically offered: Irregular)

FINN 5303. Advanced Corporate Financial Management. 3 Hours.

Focus on financial policy issues using real situational cases. Topics include cost of capital, capital budgeting and long-term planning, value-based management, real options, as well as project financing and valuation. Prerequisite: FINN 5223. (Typically offered: Irregular)

FINN 5313. Advanced Commercial Banking. 3 Hours.

This course focuses on advanced risk management strategies commonly implemented at regional and large commercial banks. Topics include financial statement analysis of banks and holding companies, credit analysis of global cash flow, Basel III capital requirements and stress testing, interest rate risk measurement and management, and interest rate hedging with derivatives. (Typically offered: Fall and Spring)

FINN 5333. Investment Theory and Management. 3 Hours.

Integration of theory, practice of investments with solution of individual and institutional portfolio management problems; Institute of Chartered Financial Analysts' Problems; variable annuity in estate planning. Prerequisite: FINN 5223. (Typically offered: Fall)

FINN 541V. Shollmier Investment Project. 1-3 Hour.

Provide students with the opportunity to design and apply complex investment strategies used in institutional portfolio management on the Shollmier MBA Fund that can involve fixed income and equity securities as well as derivatives. Students will use top down asset allocation models, bottom up security selection, and hedge fund strategies. Prerequisite: FINN 5223 and FINN 5333. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

FINN 5433. Real Estate Finance and Investment. 3 Hours.

(Formerly FINN 4433.) Consideration of professional aspects of the real estate field. Emphasis is placed upon finance techniques and investment analysis. The focus is on commercial real estate. Brokerage, property management, appraisal, property development and current problems are also addressed. Students prepare a feasibility study on a commercial development project. Graduate degree credit will not be given for both FINN 4433 and FINN 5433. Prerequisite: FINN 3933. (Typically offered: Spring)

FINN 550V. Independent Study. 1-3 Hour.

(Formerly FINN 450V.) Permits students on an individual basis to explore selected topics in finance, with the consent of instructor. Graduate degree credit will not be given for both FINN 450V and FINN 550V. (Typically offered: Irregular)

FINN 6043. Finance Theory. 3 Hours.

Provides a conceptual understanding of key theoretical developments in the field of financial economics, including firm decisions under risk within a world of uncertainty. (Typically offered: Irregular)

FINN 6133. Seminar in Investment Theory. 3 Hours.

Study advanced literature in field investments, with special reference to theory of random walks, stock valuation models, portfolio management. (Typically offered: Spring)

FINN 6233. Seminar in Financial Management. 3 Hours.

Financial management of firm with emphasis on financial theory or firm, quantitative methods used in financial analysis, planning. (Typically offered: Irregular)

FINN 6333. Empirical Research in Finance. 3 Hours.

A study of recent empirically based research in finance. (Typically offered: Irregular)

FINN 6733. Seminar in Financial Markets and Institutions. 3 Hours.

Recent developments in the literature of financial markets and institutions. Participants will be involved in the extensive study of existing theories and empirical tests of the theories. (Typically offered: Irregular)

FINN 683V. Contemporary Issues in Doctoral Colloquium. 1-3 Hour.

To explore and evaluate contemporary research issues in finance. Course content to reflect the most recent developments in theory and empirical research methodologies. Prerequisite: Doctoral student status and instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

FINN 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Information Systems (ISYS)

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Pankaj Setia
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Degrees Conferred:

Ph.D. in Business Administration (BADM)
M.I.S. in Information Systems (INSY)

Graduate Certificate:

Graduate Certificate in Enterprise Systems (ISESGC)

Program Description: The Master of Information Systems is designed to provide professional preparation for positions in business and government. It provides sufficient flexibility to meet the needs of students with various backgrounds and foster lifelong learning and innovation. Students may concentrate in one of four areas: Information Technology Management, Enterprise Resource Planning, Blockchain Enterprise Systems Management, or Software Engineering Management. The Ph.D. in Business Administration with an area of study in Information Systems is designed to produce a graduate with an understanding of the necessary subject matter required to contribute educational and research expertise to the field of information systems.

The program also offers a graduate certificate in Enterprise Systems to provide graduate students with knowledge and experience in information systems used in modern enterprise environments. The certificate includes three concentrations to allow students to focus on one facet of information systems.

Master of Information Systems

Master of Information Systems Program Website (<https://walton.uark.edu/graduate-programs/master-of-information-systems/>)

The Master of Information Systems is designed to provide professional preparation for positions in business and government. It provides sufficient flexibility to meet the needs of students with various backgrounds and foster lifelong learning and innovation. Students may concentrate in one of four areas: Information Technology Management, Enterprise Resource Planning (ERP) Management, Blockchain Enterprise Systems Management, or Software Engineering.

Admission Requirements: The Master of Information Systems program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admission Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and resident aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Requirements for the Master of Information Systems Degree:

Students whose previous studies have fulfilled requirements of the common body of knowledge in business and information systems will be required to complete a minimum of 30 hours of graduate work. The required common body of knowledge in Information Systems includes management information systems, systems analysis, database, and programming languages (such as Visual Basic, Java, or other).

To ensure that students acquire the skills necessary for career success, the M.I.S. program strongly encourages all students to obtain additional

training directly related to the M.I.S. program prior to graduation. The M.I.S. program considers this training an integral part of the curriculum and recommends that students work for up to one year in a position (or positions) which allow for the practical application of the theoretical principles taught in M.I.S. courses.

Students who hold non-immigrant status in the United States in the F-1 or J-1 categories are responsible for coordinating any necessary authorization for employment with the Office of International Students and Scholars (ISS). F-1 and J-1 students are strongly advised to discuss training options with the M.I.S. Program Director and the ISS office early in their program, and to make themselves aware of limitations and restrictions related to F-1 or J-1 employment authorization benefits.

Pre-M.I.S.

ISYS 511V	IT Toolkit & Skills Seminar (This course may not be used for the Master of Information Systems degree.)
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Core Courses

ISYS 5423	Seminar in Systems Development	3
ISYS 5833	Data Management Systems	3
ISYS 5943	Management of Information Technology Seminar	3

Areas of Concentration 15

Select one of the following concentrations:

Information Technology Management

ISYS 5213	ERP Fundamentals
ISYS 5503	Decision Support and Analytics
Computing Electives (9 hours) selected from approved ISYS and CSCE	

Enterprise Resource Planning (ERP) Management

ISYS 5213	ERP Fundamentals
ISYS 5223	ERP Configuration and Implementation
ISYS 5233	Seminar in ERP Development
Select six hours from the following:	
ISYS 5103	Data Analytics Fundamentals
ISYS 5133	Blockchain and E Business Development
ISYS 5173	Blockchain Fundamentals
ISYS 5453	Blockchain and Enterprise Data
ISYS 5503	Decision Support and Analytics
ISYS 5843	Seminar in Business Intelligence and Knowledge Management

Blockchain Enterprise Systems (BES) Management

ISYS 5133	Blockchain and E Business Development
ISYS 5173	Blockchain Fundamentals
ISYS 5453	Blockchain and Enterprise Data
Select six hours from the following:	
ISYS 5103	Data Analytics Fundamentals
ISYS 5213	ERP Fundamentals
ISYS 5463	Enterprise Transaction Systems
ISYS 5503	Decision Support and Analytics
ISYS 5843	Seminar in Business Intelligence and Knowledge Management

Software Engineering Management

ISYS 5133	Blockchain and E Business Development
ISYS 5503	Decision Support and Analytics
Select nine hours from the following:	

CSCE 3513	Software Engineering	
CSCE 5173	Formal Languages and Computability	
CSCE 5323	Computer Security	
ISYS or CSCE courses (approved by Director)		
Electives		6
Total Hours		30

M.I.S. (Part-time): The Department of Information Systems also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester; 5 semester program with Enterprise Resource Planning (ERP) Management and Blockchain Enterprise Systems (ES) Management concentrations. Contact the department for additional information or visit the Graduate School of Business website. (<http://gsb.uark.edu/>)

Electives are chosen by the student in consultation with the Master of Information Systems Program Director in the Department of Information Systems (ISYS). Approved electives (6 hours) may be any graduate course approved by the Master of Information Systems program director.

With the approval of the Master of Information Systems Program Director, any senior-level ISYS course (ISYS 4000 or higher) may be taken for graduate credit. After admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all information systems coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

For the M.I.S. (part-time), approval of the Director is required to enroll in more than six hours per semester.

Ph.D. in Business Administration (Information Systems)

Information Systems Ph.D. Program Website (<https://walton.uark.edu/graduate-programs/phd-programs/information-systems.php>)

Overview: The objective of the Ph.D. in business administration with a concentration in information systems is to prepare students to conduct quality research in information systems as a faculty member at a research-oriented university school of business. The program is designed to produce a graduate with an understanding of the necessary subject matter required to contribute educational and research expertise to the field of information systems. In addition to preparing students to be world-class researchers, the program seeks to prepare students to teach effectively in an information systems curriculum.

Admission Requirements: In addition to the university's Graduate School and Walton College of Business' Graduate School of Business requirements, the ISYS Ph.D. program has the following requirement: Applicants are expected to have a background in information systems via prior courses in topics such as a programming language, systems analysis, design, and development, and database processing. Students without the background may also be admitted but will likely be required to take up to 3 master's level courses to remedy the deficiency.

Requirements: Requirements for the Ph.D. in business administration with concentration in information systems include core courses and elective courses in information systems, research tools, and supporting fields. These 43 credit hours of courses are taken prior to advancing to candidacy and are broken down as follows: research tools (9 hours); ISYS core courses (21 hours); and supporting field courses (13 hours). Also, there is a requirement that students satisfactorily complete a one-hour Graduate Colloquium during the fall and spring semesters of

each year when students are in residence on campus in pursuit of the degree. Following completion of the coursework, students must pass a comprehensive examination. The program also requires completion of 1st and 2nd year summer research projects, defense of a dissertation proposal, and successful defense of the dissertation (18 credit hours). Students are also prepared for a career in research through research assistantships, collaborative research projects with faculty members, colloquia, and classroom teaching and support.

Course Requirements

Research Tools

ISYS 5203	Experimental Design	3
ISYS 5623		
ISYS 5723	Advanced Multivariate Analysis	3

Information Systems Core Courses

Select seven of the following:		21
ISYS 6133	Survey of IS Research	
ISYS 6233		
ISYS 6333	Individual-level Research in IS	
ISYS 6433		
ISYS 6533	Macro- and Meso-level IS Research	
ISYS 6633	Systems Development	
ISYS 6733	Emerging Topics	
ISYS 6833	Theory Development	
ISYS 601V	Graduate Colloquium	

Supporting Fields

In addition to the WCOB 6111 Teaching Seminar and MGMT 6213 Research Methods Seminar, courses to meet this requirement will be determined in consultation with the ISYS Ph.D. program committee (courses must be at the Ph.D. level, unless otherwise approved by the ISYS Ph.D. program committee). These courses are normally taken outside the ISYS Department and are in the student's area(s) of interest.

WCOB 6111	Seminar in Business Administration Teaching I	1
MGMT 6213	Seminar in Research Methods	3

Comprehensive Examination

Written exam, research tools and IS (at the end of all coursework)	
Oral exam	

Summer Research Requirements

1st summer paper	
2nd summer (to include a round of feedback and revision)	

Dissertation Requirements

Successful defense of Dissertation proposal ¹	
Successful defense of Dissertation ¹	

Other Ph.D. Courses Taken

Students may take up to 9 hours of other Ph.D. courses, as necessary.

Masters Level Courses

Students typically without an information systems background will be required to take some Masters courses prior to taking their comprehensive examinations. These courses do not count toward the Ph.D. degree and are taken to remedy deficiencies. The ISYS Ph.D. program committee will determine whether a student needs to take one or more of these courses. The specific courses are:

ISYS 5423	Seminar in Systems Development	
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ISYS 5503	Decision Support and Analytics
ISYS 5833	Data Management Systems

¹ Minimum committee size: 4

Residence Requirement

There is a strong preference for students to be in residence — i.e., be full-time students with assistantship duties — during the entire program. Residence requirements are intended to ensure that every student has ample opportunity for the intellectual development that can result from a sustained period of intensive study and close association with scholars in the intellectual environment of the university. The requirement recognizes that growth as an independent scholar is not merely a matter of class attendance, but rather involves a broader development of the intellect that comes through intensive study, independent research, sustained association with faculty members and other colleagues who share common scholarly and professional interests, attendance at seminars and colloquia, intensive reading and familiarization with library resources, consultation with specialists in other disciplines and resource centers, and the opportunity for broadened exposure to current intellectual issues as they are revealed in various campus offerings.

After filing a Declaration of Intent to pursue the doctoral degree, a student must fulfill a residence requirement as outlined in the Graduate Catalog (p. 430) section on doctors of philosophy and education degrees.

Graduate Certificate in Enterprise Systems

Paul Cronan
Director
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cronan@uark.edu

Enterprise Systems Graduate Certificate Program Website (<https://gsb.uark.edu/graduate-certificates/>)

The Graduate Certificate in Enterprise Systems is a part-time program offered on campus, blended, and online. It is designed to provide graduate students with knowledge and experience in information systems used in modern enterprise environments. The demand for skilled professionals in information systems continues to outpace the supply of qualified applicants. Students may choose one of three concentrations for the Graduate Certificate in Enterprise Systems: Blockchain Enterprise Information Systems, Business Analytics, or Enterprise Resource Planning. The certificate program is intended to be completed part-time (ordinarily no more than six hours per semester), and is open to individuals with backgrounds in any discipline.

Admission Requirements: The Graduate Certificate in Enterprise Systems is a part-time program open to individuals with backgrounds in any discipline. Students must apply and be admitted to the Graduate School of Business; the GMAT/GRE requirement is waived for the Graduate Certificate in Enterprise Systems degree program. (Students who have earned a GPA 3.5 or better upon completion of the certificate program and subsequently apply to the part-time Master of Information Systems program (Professional M.I.S.) will not be required to submit a test score). Information regarding Graduate School of Business admission requirements can be found earlier in this chapter.

Requirements for the Graduate Certificate in Enterprise Systems: (12 hours)

To receive the Graduate Certificate in Enterprise Systems, students must select one of the tracks below. Students are required to take 9 hours of coursework in the Walton College of Business and 3 hours of electives related to Enterprise Systems in either the Walton College or in another college at the University of Arkansas. Elective courses other than those listed below must be approved by the director of the certificate program. Some elective courses have prerequisites that are not met by courses in the certificate program. Students are advised to check prerequisites prior to enrolling in a course.

Required Course

Choose at least one of the following depending on the track chosen:

ISYS 5173	Blockchain Fundamentals
ISYS 5103	Data Analytics Fundamentals
ISYS 5213	ERP Fundamentals

Blockchain Enterprise Systems Track

This track is open to individuals with backgrounds in fields other than Information Systems and is designed to provide non-IS graduate students with the fundamental knowledge and skills needed to successfully transition to a career in the Information Systems field. Students who complete this track will have exposure to fundamental principles of blockchain, enterprise information systems, and techniques for management and development of blockchain projects.

Required Courses (9 hours)

ISYS 5173	Blockchain Fundamentals	3
ISYS 5133	Blockchain and E Business Development	3
ISYS 5453	Blockchain and Enterprise Data	3
Students should choose 3 hours of coursework from among the following:		3

ISYS 5103	Data Analytics Fundamentals (recommended)
ISYS 5213	ERP Fundamentals
ISYS 5463	Enterprise Transaction Systems
ISYS 5833	Data Management Systems

Total Hours	12
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Business Analytics Track

This track is open to individuals with backgrounds in any discipline and is designed to give business and non-business graduate student's knowledge and experience in the management and use of enterprise data for operations and decision-making. The ability to effectively manage and analyze increasingly large and complex sets of data is highly valued among employers in all disciplines, as "business intelligence" becomes a primary source of competitive advantage in many organizations. Students who complete this track will have a foundation in the effective management and use of relational and dimensional data, the application of statistical decision-making theory, and the exploration and exploitation of data using advanced data mining tools and techniques. Students completing this track may be eligible to receive a certificate endorsed by the SAS Institute.

Required Courses (9 hours)

ISYS 5103	Data Analytics Fundamentals	3
ISYS 5503	Decision Support and Analytics	3

ISYS 5843	Seminar in Business Intelligence and Knowledge Management	3
Students should choose 3 hours of coursework from among the following:		3
ISYS 511V	IT Toolkit & Skills Seminar (this course may not be used for the Masters of Information Systems Degree)	
ISYS 5133	Blockchain and E Business Development	
ISYS 5213	ERP Fundamentals	
ISYS 5423	Seminar in Systems Development	
ISYS 5833	Data Management Systems	
Total Hours		12

Enterprise Resource Planning Track

This track is open to individuals with backgrounds in any discipline and is designed to provide business and non-business graduate students a foundation in the effective use, implementation, and customization of Enterprise Resource Planning (ERP) systems. ERP systems support integrated core business processes in nearly every large organization, and knowledge of and experience with these systems are highly valued among employers in all business disciplines. Students who complete this track will have exposure to fundamental principles of ERP and techniques for configuration, implementation, and development of ERP systems. Students completing this track may be eligible to receive a certificate endorsed by SAP America and the SAP University Alliances Program.

Required Courses (9 hours)

ISYS 5213	ERP Fundamentals	3
ISYS 5223	ERP Configuration and Implementation	3
ISYS 5233	Seminar in ERP Development	3
Students should choose 3 hours of coursework from among the following:		3
ISYS 511V	IT Toolkit & Skills Seminar (recommended)	
ISYS 5103	Data Analytics Fundamentals	
ISYS 5173	Blockchain Fundamentals	
ISYS 5453	Blockchain and Enterprise Data	
ISYS 5833	Data Management Systems	
Total Hours		12

Graduate Faculty

Anand, Abhijith, Ph.D. (University of Waikato), M.I.S. (University of Wollongong), B.E. (K.S. Institute of Technology), Assistant Professor, 2017.

Bright, Brittany Michelle, M.I.S. (University of Arkansas), B.S. (University of Arkansas, Fort Smith), Instructor, 2010.

Bristow, Susan E., Ed.D., M.B.A., B.S.B.A. (University of Arkansas), Clinical Assistant Professor, 1997.

Bruce, David E., M.I.S. (University of Arkansas), Lecturer, 1999.

Conway, Daniel, Ph.D. (Indiana University), Teaching Professor, .

Cronan, Timothy P., Ph.D. (Louisiana Tech University), M.S. (South Dakota State University), B.S. (University of Southwestern Louisiana), Professor, 1979.

Douglas, David, Ph.D., M.S.I.E., B.S.I.E. (University of Arkansas), University Professor, 1975.

Ehrhardt, Joseph, M.I.S. (University of Arkansas), Instructor, 2014.

Freeze, Ron, Ph.D. (Arizona State University), M.B.A. (University of Missouri–Kansas City), B.S. (General Motors Institute), Clinical Associate Professor, 2015.

Grover, Varun, Ph.D. (University of Pittsburg), M.B.A. (Southern Illinois University), B.S. (Indian Institute of Technology), Distinguished Professor, 2017.

Hoehle, Hartmut, Ph.D., B.Com. (Victoria University of Wellington), Associate Professor, 2013.

Keiffer, Elizabeth, Ph.D., M.A. (University of Arkansas), B.S. (East Central University), Teaching Assistant Professor, 2016.

Kindy, Phillip D., M.I.S. (University of Arkansas), B.S. (DeVry Institute of Technology), Instructor, 2012.

Lacity, Mary, Ph.D. (University of Houston), B.S.B.A. (Pennsylvania State University), Professor, 2018.

Ma, Xiao, Ph.D. (University of Wisconsin), M.A. (Syracuse University), B.A. (Nanjing University), Assistant Professor, 2014.

Mackey, Andrew, M.S. (University of Arkansas), Instructor, 2014.

Malladi, Suresh, Ph.D. (University of Michigan), M.S. (Carnegie Mellon University), M.B.A. (National Institute of Technology), B.E. (Osmania University), Assistant Professor, 2014.

McDaniel, Beverly, M.Ed., B.S. (University of Arkansas), Instructor, 1993.

Mullins, Jeff, M.A., B.S. (University of Arkansas), Assistant Professor, 2006.

Sabherwal, Rajiv, Ph.D. (University of Pittsburgh), P.G.D.M. (Indian Institute of Management), B.S.E.E. (Regional Engineering College, India), Distinguished Professor, 2011.

Serrano, Christina, Ph.D. (University of Georgia), B.B.A. (Armstrong Atlantic State University), Assistant Professor, 2011.

Setia, Pankaj, Ph.D. (Michigan State University), M.B.A. (Management Development Institute), B.S. (University of Delhi, India), Associate Professor, 2008.

Steelman, Zachary R., Ph.D., M.I.S. (University of Arkansas), B.B.A. (Northeastern State University), Assistant Professor, 2017.

Sykes, Tracy Ann, Ph.D. (University of Arkansas), B.S. (University of Maryland-College Park), Associate Professor, 2011.

Syler, Rhonda A., Ph.D. (Auburn University), M.B.A. (Columbus State University), M.S. (Kansas State University), B.S. (Middle Tennessee State University), Clinical Assistant Professor, 2016.

Venkatesh, Viswanath, Ph.D. (University of Minnesota-Twin Cities), B.E. (Bharathiar University, India), Distinguished Professor, 2004.

Courses

ISYS 5103. Data Analytics Fundamentals. 3 Hours.

Fundamental knowledge and skills in several major areas of business data analytics. Emphasis on the management and use of data in modern organizations, intermediate & advanced spreadsheet topics; relational databases & SQL; and programming (such as Python). Prerequisite: MIS Director approval. (Typically offered: Fall)

ISYS 511V. IT Toolkit & Skills Seminar. 1-3 Hour.

Seminar in Information Systems solutions and concepts (such as applications development, VB.NET, analysis of problems and design of solutions via application systems, etc.) designed for students entering the MIS program—may not be used for MIS degree credit. Prerequisite: MIS Director approval. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

ISYS 5133. Blockchain and E Business Development. 3 Hours.

This course explores various blockchain and e-business development technologies and then utilizes these technologies for developing a realistic application. Students will also learn strategies and use a varied web stack to build web pages that interact with blockchain platforms. Pre- or corequisite: ISYS 5173. (Typically offered: Fall)

ISYS 516V. Independent Study. 1-3 Hour.

(Formerly ISYS 450V.) Permits students on individual basis to explore selected topics in data processing and/or Quantitative Analysis. Graduate degree credit will not be given for both ISYS 450V and ISYS 516V. (Typically offered: Fall and Spring)

ISYS 5173. Blockchain Fundamentals. 3 Hours.

This course provides the fundamental concepts underpinning blockchain technologies. The focus is on blockchain applications for business. Students will learn about the overall blockchain landscape, including investments, the size of markets, major players and the global reach, as well as the potential business value of blockchain applications and the challenges that must be overcome to achieve that value. Students will learn enough about the underlying technologies to speak intelligently to technology experts and will be well-prepared to develop blockchain applications in future courses. Prerequisite: Graduate standing and departmental consent. (Typically offered: Fall, Spring and Summer)

ISYS 5203. Experimental Design. 3 Hours.

ANOVA, experimental design, introduction to basis of statistics. Prerequisite: Graduate standing and WCOB 1033 or equivalent. (Typically offered: Fall)

ISYS 5213. ERP Fundamentals. 3 Hours.

An introduction to enterprise resource planning systems. Students should gain an understanding of the scope of these integrated systems that reach across organizational boundaries and can change how a company does business. Implementation issues are covered, including the importance of change management. Prerequisite: Graduate standing. (Typically offered: Fall and Summer)

ISYS 5223. ERP Configuration and Implementation. 3 Hours.

The process of configuring and implementing an enterprise resource planning system. Business process analysis and integration. Students will develop a company and set up several modules in SAP for use. Develop understanding of how the business processes work and integrate. Prerequisite: ISYS 5213 or equivalent. (Typically offered: Fall and Spring)

ISYS 5233. Seminar in ERP Development. 3 Hours.

ERP administration and system development practices. Advanced system support issues related to Enterprise Resource Planning systems that are used in global organizations. Basic ABAP programming. In addition, students will learn how to provide basic systems administration support of the operating system, database, and application systems software levels of ERP systems. Pre- or Corequisite: ISYS 5223. Prerequisite: ISYS 5213. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

ISYS 5243. Current Topics in Computer Information. 3 Hours.

(Formerly ISYS 4243.) Intensive investigation of selected developments in computer information systems hardware, software, and organization having current impact on computer information systems design and application. Offering an extension of lower-level CIS courses through individual student research and faculty team-teaching of advanced topics. Topical selection made with each course offering. Graduate degree credit will not be given for both ISYS 4243 and ISYS 5243. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ISYS 535V. Internship Experience. 1-6 Hour.

This course allows a student to experience an internship within a business and benefit from the work experience. The internship focuses on applications and business problems and is supervised by a faculty member as well as a member of the company/firm. Prerequisite: MIS Director approval is required. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ISYS 5363. Business Analytics. 3 Hours.

This course in managerial business analytics provides future managers with the key concepts of decision modeling and information technology management concepts. Students will learn to utilize real time operational business data, as well as quickly process and effectively leverage information. In addition, students will exercise strategic IT deployment skills for supply chain and marketing processes as well as develop strong decision modeling abilities. (Typically offered: Spring)

ISYS 5373. Application Development with Java. 3 Hours.

(Formerly ISYS 4373.) This course covers object-oriented programming concepts and illustrates them via an appropriate object-oriented programming language. Students will be exposed to the design of software objects, creation of software objects, and the use of objects in constructing an information system. Graduate degree credit will not be given for both ISYS 4373 and ISYS 5373. Prerequisite: ISYS 3293 with a grade of C or better. (Typically offered: Fall)

ISYS 5403. Quantitative Methods and Decision Making. 3 Hours.

Utilization of information, quantitative techniques, and computer application in decision making and problem solving for managers. (Typically offered: Irregular) This course is cross-listed with SCMT 5133.

ISYS 5423. Seminar in Systems Development. 3 Hours.

Advanced study of structured systems development. Emphasis on strategies and techniques of structured analysis and structured design for producing logical systems specifications and for deriving physical systems designs. Coverage of methodologies for dealing with complexity in the development of information systems. Prerequisite: ISYS 511V. (Typically offered: Fall)

ISYS 5433. Enterprise Systems. 3 Hours.

Enterprise Systems comprises the entire class of information technology and systems that support the mission of the company including decision support and business processes. This managerial enterprise systems course focuses on strategic issues of information technology. Students study the various elements and integration of an organization's business processes; as a result, students gain an understanding and working knowledge of systems used to support these business processes and their use in decision making. In addition, students will study concepts and develop skills needed to utilize decision-centric business intelligence and knowledge management applications. (Typically offered: Spring)

ISYS 5453. Blockchain and Enterprise Data. 3 Hours.

The focus of this course is to expose students to working with distributed and service oriented architectures for different applications as well as the IT infrastructure needed. The course provides the opportunity for students to gain valuable insight into blockchain as a distributed system and cloud architecture platforms with the goal of developing enterprise applications. Prerequisite: ISYS 5133. (Typically offered: Spring)

ISYS 5463. Enterprise Transaction Systems. 3 Hours.

Being able to accurately capture and store business transactions is an important processing function in many businesses. For many large companies with high volume processing, the tools of choice for transaction processing are applied. This course provides students with the necessary understanding and skills to develop advanced applications in mainframe environment. Pre- or Corequisite: ISYS 5453 or equivalent or MIS Director approval. (Typically offered: Irregular)

ISYS 5503. Decision Support and Analytics. 3 Hours.

Analysis of the highest level of information support for the manager-user. A study of systems providing analytics-based information derived from databases within and/or external to the organization and used to support management in the decision making. Application of tools in business analytics, problem solving, and decision making. Prerequisite: MIS Director approval. (Typically offered: Fall)

ISYS 5603. Analytics and Visualization. 3 Hours.

This course focuses on how to discern and tell your story visually using data based on traditional graphical data representation as well as the latest data and information technologies. Coverage includes both visualization theory and hands-on exercises using appropriate computing tools. The course will also include visualization of predictive, clustering, and association models. The opportunities and challenges of Big Data visualization will be explored. Corequisite: Lab component. Prerequisite: (ISYS 5503) or (ISYS 5133 and departmental consent). (Typically offered: Fall)

ISYS 5713. Seminar in IS Topics. 3 Hours.

Intensive seminar in selected information systems topics. Topical selection made with each course offering. Prerequisite: ISYS 511V or MIS Director approval. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ISYS 5723. Advanced Multivariate Analysis. 3 Hours.

Factor analysis and other advanced techniques. Prerequisite: ISYS 5623. (Typically offered: Irregular)

ISYS 5833. Data Management Systems. 3 Hours.

Investigation and application of advanced database concepts include database administration, database technology, and selection and acquisition of database management systems. Data modeling and system development in a database environment. Prerequisite: ISYS 5103. (Typically offered: Spring)

ISYS 5843. Seminar in Business Intelligence and Knowledge Management. 3 Hours.

Business intelligence focuses on assessing and creating information and knowledge from internal and external sources to support business decision making process. In this seminar, data mining and information retrieval techniques will be used to extract useful knowledge from data, which could be used for business intelligence, and knowledge management. Pre- or Corequisite: ISYS 5833 or equivalent. Prerequisite: ISYS 5503 or equivalent. (Typically offered: Spring)

ISYS 593V. Global Technology and Analytics Seminar. 1-3 Hour.

This course is designed to provide an updated, comprehensive, and rigorous treatment of emerging global topics. Includes, but is not limited to, global study experiences, business insights, and foundational perspectives; examines significant issues from global perspectives. Prerequisite: Department Consent, Graduate standing, and MIS Director approval. (Typically offered: Summer) May be repeated for up to 3 hours of degree credit.

ISYS 5943. Management of Information Technology Seminar. 3 Hours.

Presented in a way that allows you to play an active role in the design, use, and management of information technology. Using IT to transform the organization, as competitive strategy, and creating new relationship with other firms is included. Pre- or Corequisite: ISYS 5833. Prerequisite: ISYS 5423. (Typically offered: Spring)

ISYS 599V. Practicum Seminar. 1-6 Hour.

This course is designed to introduce and engage the student in the practice, application, and problem solving in the business environment. Hands-on application of a business problem. Students will gain experience working on, making decisions about, and developing solutions for business applications. Topics include but not limited to analytics, data, and information technology. Prerequisite: Graduate standing and MIS Director approval. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ISYS 601V. Graduate Colloquium. 1-6 Hour.

Presentation and critique of research papers and proposals. (Typically offered: Fall and Spring)

ISYS 6133. Survey of IS Research. 3 Hours.

This is an introductory seminar in information systems research for doctoral students. Its objective is to introduce participants to major streams of IS research and discuss many of the important roles and responsibilities of an IS researcher. Also, this course will play the important role of introducing participants to the research of the current IS faculty. (Typically offered: Fall)

ISYS 6333. Individual-level Research in IS. 3 Hours.

This course aims to expose students to individual-level research in IS. It provides a window into major streams of individual-level research in IS and reference disciplines. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

ISYS 636V. Special Problems. 1-6 Hour.

Independent reading and research under supervision of senior staff member. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ISYS 6533. Macro- and Meso-level IS Research. 3 Hours.

This course aims to expose students to research at the macro- and meso-levels. For example, it could provide a window into major streams of organizational-level research in IS and reference disciplines. Topics could also include: change management, ERP research models, implementation, applications, and successes/failures, and ERP simulation models. Other topics that fall within the purview of the course are: large-scale technology and process innovations in organizations--e.g., software development process innovations and RFID will be examined at various levels (e.g., organizational). (Typically offered: Irregular)

ISYS 6633. Systems Development. 3 Hours.

The course provides an in-depth study of systems development as an area of research, understanding of the theoretical and conceptual foundations, insight into the current state of the research area, utilizes both IS and reference discipline literature as appropriate, guidance for conducting research projects and producing publishable research, an opportunity to work on cutting-edge research. (Typically offered: Irregular)

ISYS 6733. Emerging Topics. 3 Hours.

Various emerging topics, such as RFID applications and RFID supply chain, ethical decision models, behavioral modeling, piracy and privacy issues, and virtual worlds. (Typically offered: Irregular) May be repeated for up to 15 hours of degree credit.

ISYS 6833. Theory Development. 3 Hours.

To acquire theory development and writing skills, to understand challenges in developing and writing theory sections of papers, and to discuss approaches to writing good empirical journal articles. This course is suited for all social sciences students and is particularly appropriate for students conducting behavioral research in the business disciplines. (Typically offered: Irregular)

ISYS 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

J.D./M.B.A. Program

J.D./M.B.A. program

For students interested in obtaining both the M.B.A. and J.D. (law) degrees, the M.B.A./J.D. dual degree program is available. This program allows the student to receive both the M.B.A. degree and the J.D. degree. The program requires separate application and admission to both the School of Law and the Graduate School of Business and the M.B.A. degree program. Interested students should obtain bulletins and applications from both the School of Law and the Graduate School of Business. If the student is accepted into both programs, a maximum of twelve hours of approved law core courses may be used as duplicate credit toward the M.B.A. degree. These 12 hours of law core courses shall be applied to the 12 hours of career track courses within the M.B.A. degree plan. Likewise, a maximum of 12 hours of approved M.B.A. core courses may be used as duplicate credit toward the J.D. degree, thus reducing the total time necessary for the completion of both degrees.

Management (MGMT)

John Delery
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Adam Stoverink
Ph.D. Program Director
420 Business Building
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Degree Conferred:

Ph.D. in Business Administration (BADM)

Program Description: The primary objective of the Ph.D. program in Business Administration with an area of study in Management is to prepare candidates for careers in university research and teaching. The program of study is designed to ensure that students receive an exposure to the broad areas of management, develop the conceptual skills and methodological tools necessary to design and conduct independent research, and develop the skills and experience necessary to teach at all levels of higher education.

Ph.D. in Business Administration (Management)

Program Requirements: The primary objective of the Ph.D. program in Management is to prepare candidates for careers in university research and teaching. The program of study is designed to ensure that students receive an exposure to the broad areas of Management, develop the conceptual skills and methodological tools necessary to design and conduct independent research, and develop the skills and experience necessary to teach at all levels of higher education.

Required Courses (13 hours)

MGMT 6113	Seminar in Organizational Behavior	3
MGMT 6123	Seminar in Organization Theory	3
MGMT 6133	Seminar in Strategy Research	3
MGMT 6233	Seminar in Human Resource Management	3
WCOB 6111	Seminar in Business Administration Teaching I	1

Supporting Fields (12 hours)

Courses for the supporting fields requirement are selected in consultation with the student's Ph.D. Advisory Committee. All courses taken for the Supporting Fields must be at the graduate level and/or taken for graduate credit.

Choose four courses from the following: 12

ISYS 6833	Theory Development	
MGMT 6011	Graduate Colloquium	
MGMT 636V	Special Problems in Management	
PSYC 5063	Advanced Social Psychology	
PSYC 6373	Seminar in Personality and Social Psychology	
SCMT 6433	Supply Chain Management Research	
WLLC 575V	Special Investigations	

Research Requirements (18 hours)

Courses used to meet the Research Requirements will be selected in consultation with the student's Ph.D. Advisory Committee and should support the student's program of study. The courses should provide the student with a knowledge of advanced descriptive and inferential statistics, research design, and research methods.

MGMT 6213 Seminar in Research Methods 3

Choose five courses from the following: 15

COMM 5173	Qualitative Methods in Communication	
ESRM 6423	Multiple Regression Techniques for Education	
ESRM 6533	Qualitative Research	
ISYS 5723	Advanced Multivariate Analysis	
ISYS 6733	Emerging Topics	
MGMT 636V	Special Problems in Management (repeatable for twelve hours total within the degree program)	
MKTG 6433	Seminar in Research Methods	
PADM 5803	Quantitative Methods Analysis	

PLSC 5943 Advanced Research Methods in Political Science

PSYC 5133 Inferential Statistics for Psychology

PSYC 5143 Advanced Descriptive Statistics for Psychology

PSYC 6343 Seminar in Quantitative Methods

PUBP 6143 Mixed Method Research Design

Dissertation

MGMT 700V Doctoral Dissertation 18

Candidacy Exam

Students will be required to take a candidacy examination in the summer following the second year coursework as a requirement of the Ph.D. program. The exam will cover the students' major and minor content areas as well as research methods. Successful completion of all parts of the candidacy exam are required to begin dissertation research.

Students must complete a minimum of 72 graduate credit hours beyond the bachelor's degree and 42 graduate credit hours beyond the master's degree. For students who apply to the degree program without a master's degree, a minimum of 11 additional credit hours in consultation with the Ph.D. coordinator will be required to fulfill the full degree requirements to include approved graduate courses. Additional hours may be assessed in individual cases to meet specific coursework deficiencies.

For a complete list of University Graduate School and International Education degree requirements, please visit the Objectives and Regulations (p. 424) page of the catalog.

Graduate Faculty

Anand, Vikas, Ph.D. (Arizona State University), M.B.A. (Indian Institute of Foreign Trade), M.Sc. (Birla Institute of Technology), Professor, 1999.

Breaux-Soignet, Denise, Ph.D. (Florida State University), M.B.A., B.S. (Nicholls State University), Clinical Assistant Professor, 2010.

Delery, John, Ph.D. (Texas A&M University), M.S. (Memphis State University), B.S. (Tulane University of Louisiana), Professor, 1992.

Dowdy, Gary, M.B.A. (Purdue University), B.S. (University of Arkansas), Instructor, 2014.

Ellstrand, Alan E., Ph.D. (Indiana University at Bloomington), M.B.A. (North Illinois University), B.S. (University of Illinois-Urbana), Professor, 2000.

Goussevskaya, Anna, Ph.D. (University of Warwick, United Kingdom), B.Sc. (Federal University of Minas, Brazil), Clinical Assistant Professor, 2013.

Gupta, Nina, Ph.D., A.M. (University of Michigan-Ann Arbor), M.A., B.A. (University of Allahabad), Distinguished Professor, 1984.

Johnson, Jon, Ph.D. (Indiana University at Bloomington), M.B.A., B.S. (University of Arkansas), Professor, 1996.

Kish-Gephart, Jennifer, Ph.D. (Pennsylvania State University), M.B.A., B.S. (Drexel University), Associate Professor, 2010.

Lueke, Sarah B., Ph.D. (University of Akron), Clinical Assistant Professor, 2019.

McKnight, Rebecca, M.B.A. (University of Arkansas), Instructor, 2016.

Mlakar, Paul Francis, M.B.A. (University of Arkansas), Instructor, 2019.

O'Leary-Kelly, Anne M., Ph.D. (Michigan State University), B.A. (University of Michigan), Professor, 1997.

Pullen, Brian K., M.B.A. (University of Arkansas), B.S. (Arkansas Tech University), Instructor, 2000.

Reeves, Carol, Ph.D. (University of Georgia), M.A. (University of South Carolina), B.S. (Georgia Southern College), Professor, 1990.

Ridge, Jason, Ph.D., M.A., B.A. (Oklahoma State University), Associate Professor, 2015.

Rodeffer, Carolyn, M.B.A. (University of Chicago), B.A. (University of Maryland), Instructor, 2015.

Rosen, Chris, Ph.D. (University of Akron), M.A. (Appalachian State University), B.A. (Washington and Lee University), Professor, 2006.

Stoverink, Adam, Ph.D., (Texas A&M University), M.B.A. (St. Louis University), B.S.B.A. (University of Missouri), Assistant Professor, 2017.

Worrell, Dan, Ph.D., M.S., B.S. (Louisiana State University), Professor, 2005.

Courses

MGMT 5213. Business Foundations for Entrepreneurs. 3 Hours.

Introduction to the fundamental business concepts an entrepreneur needs to know to evaluate and launch a successful new venture. Topic areas include recruitment, selection, motivation and management of employees, market analysis and the marketing mix, financial strategies and accounting for funds, economic considerations, and the management of operations. Prerequisite: Graduate standing. (Typically offered: Spring)

MGMT 5223. Business Leadership and Ethics. 3 Hours.

Management for a global environment. The class will cover interpersonal workplace skills such as leadership and motivation, along with the management of human capital through well designed recruitment, selection, performance evaluation, compensation, and quality control systems. (Typically offered: Fall) May be repeated for degree credit.

MGMT 5313. Strategic Management. 3 Hours.

Strategy formulation, strategy implementation, and other topics related to the long-term success of the firm. Includes role of the general manager, international issues, and the impact of management fads on decision making. (Typically offered: Summer)

MGMT 5323. New Venture Development. 3 Hours.

Focuses on the identification and analysis of new venture opportunities and how entrepreneurs acquire the human and financial resources needed to develop successful businesses. Topics include market analysis, development of products and services, negotiation, developing and executing business plans, and new venture financing. Students are required to complete summer assignments before the course begins in the fall semester. Prerequisite: MGMT 5213 or an undergraduate degree in business or permission of the instructor. (Typically offered: Fall)

MGMT 5363. Innovation & Creativity. 3 Hours.

This class will provide a framework for developing, assessing and implementing innovations in start-ups and established businesses. Focus is on creative decision making, managing for innovation, strategic analysis of innovations, and implementation of innovations. Aimed at entrepreneurs, brand managers, and managers in industries where innovation is a key strategic capability. (Typically offered: Spring)

MGMT 537V. Global Business. 1-3 Hour.

Integrated overview of the global business environment and the organizational challenges of a multinational firm. To enhance understanding of the business and cultural environment of prominent emerging markets, the course includes a 2-3 week overseas immersion project to fulfill a predefined goal. Project is integrated with global content upon return. (Typically offered: Summer)
This course is cross-listed with ECON 537V.

MGMT 5391. Business History and Practice. 1 Hour.

This course provides students with an overview of how businesses evolve over the years, and how they are run today. Using examples from research and practitioner articles, it allows students to learn about hands on concepts such as business models, Integrative Performance, Organization Structure, Competitive Advantage, Value Networks, and Business Obligations in an experiential manner. (Typically offered: Fall and Spring)

MGMT 5413. New Venture Development II. 3 Hours.

A large-scale, real world, 10 week project involving hands-on work addressing issues faced by managers in partnering firms. Corequisite: Instructor consent. Prerequisite: MGMT 5323. (Typically offered: Spring)

MGMT 5602. Introduction to Strategy. 2 Hours.

An introduction to the value chain concept, the underlying framework of the Managerial MBA program. Topics include the primary value chain activities of inbound logistics, operations, outbound logistics, marketing and sales, and service, as well as the support activities of procurement, technology development, human resource management and firm infrastructure. (Typically offered: Fall)

MGMT 5613. Leadership and Organizational Behavior. 3 Hours.

Managing in a global workforce, including human resource issues, motivation, performance evaluation, quality concepts, transformational leadership, and selection/ recruitment/ development of employees. (Typically offered: Summer)

MGMT 5993. Entrepreneurship Practicum. 3 Hours.

Hands-on management of an actual on-going business. Students will gain experience working in, making decisions about, and managing a competitive business. Students will be required to analyze the business in a term paper or other integrative assignment. Entrance by application only. (Typically offered: Fall, Spring and Summer)

MGMT 6011. Graduate Colloquium. 1 Hour.

Presentation and critique of research papers and proposals. (Typically offered: Fall and Spring) May be repeated for degree credit.

MGMT 6113. Seminar in Organizational Behavior. 3 Hours.

Survey of theoretical and empirical literature in organizational behavior. Stresses critical evaluation of current writing in the field and its integration with prior research. Covers topics relating to motivation, individual differences, job attitudes, social influence processes, and group dynamics. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6123. Seminar in Organization Theory. 3 Hours.

This Ph.D.-level seminar presents an overview and introduction into organization theory literature. Emphasis on the development of relevant schools of thought, changes in the content of the traditional or 'mainstream' themes, current topics, schools of thought, and future directions are examined. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6133. Seminar in Strategy Research. 3 Hours.

This Ph.D.-level seminar presents an overview and introduction into the strategic management literature. Emphasis on both the content and process of the extant research. Relevant theory, methods, 'mainstream' themes, current topics, schools of thought, and future directions are examined. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6213. Seminar in Research Methods. 3 Hours.

Familiarizes students with the principles and techniques underlying research in management and organizations. Issues of basic philosophy of science and research methods are covered. Special attention given to the practical problems of research design, measurement, data collection, sampling, and interpretation in conducting research in management and in organizations. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6223. Seminar in Management Topics. 3 Hours.

Seminar in special research topics in management. Topics vary depending upon instructor. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MGMT 6233. Seminar in Human Resource Management. 3 Hours.

Provides an overview of major issues in human resource management. Designed to familiarize students with the seminal research in human resource management, and to provide them with the conceptual and methodological tools necessary to do research in the area. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 636V. Special Problems in Management. 1-12 Hour.

Individual reading and research. (Typically offered: Fall and Spring) May be repeated for up to 12 hours of degree credit.

MGMT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Marketing (MKTG)

Department Chair
302 Business Building
479-575-4055

Thomas Jensen
Ph.D. Program Director
325 Business Building
tjensen@walton.uark.edu

Degrees Conferred:

Ph.D. in Business Administration (BADM)

Program Description: The Ph.D. in Business Administration with an area of study in Marketing allows students to concentrate within one of three areas:

- Channels (e.g., retail, logistics, transportation, supply chain management)
- Management (e.g., strategy, international, relationship marketing)
- Communications (e.g., consumer behavior, advertising, promotion).

The student's area of study will determine the courses taken in fulfilling the supporting fields requirement and the specialization for the comprehensive examination.

Ph.D. in Business Administration (Marketing)

Program Requirements: The Ph.D. Program in Business Administration with a Marketing Concentration is comprised of 60-61 credit hours.

Required Courses 24-25

MKTG 636V	Special Problems in Marketing (up to 12 hours)	
MKTG 6413	Special Topics in Marketing (must be consumer behavior content)	
MKTG 6443	Seminar in Marketing Theory	
WCOB 6111	Seminar in Business Administration Teaching I (Required for students teaching in the program)	

Supporting Fields Courses 9-18

Courses for the supporting field requirement are made in consultation with the Doctoral Program Coordinator and/or the student's Doctoral Program Advisory Committee. All courses taken for the supporting fields must be at the graduate level and/or taken for graduate credit. A minimum of 9 hours should be taken in graduate research seminars. Students may complete up to 18 hours.

Research Methods Requirements

MKTG 6433	Seminar in Research Methods	3
Electives	To be determined in consultation with the Doctoral Program Coordinator	15

Dissertation

MKTG 700V	Doctoral Dissertation	18
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Candidacy Exam

After satisfactory completion of all required course work, each Ph.D. student must pass a written candidacy examination prepared by the Doctoral Program Committee of the Department of Marketing and administered on a date selected by the Doctoral Program Committee. Each student is expected to take the written candidacy exam within 36 months after starting coursework. If the written candidacy examination is failed, it should be retaken within 6 months after the failure on a date selected by the Doctoral Program Committee of the Department of Marketing. If the written exam is failed a second time, and if the Doctoral Program Committee allows a third sitting, the examination must be retaken within 6 months after the second failure. Failure to satisfactorily complete the written candidacy examination results in termination from the program.

Students must complete a minimum of 72 graduate credit hours beyond the bachelor's degree and 42 graduate credit hours beyond the master's degree. For students who apply to the degree program without a master's degree, a minimum of 11-12 additional credit hours in consultation with the Doctoral Program Coordinator will be required to fulfill the full degree requirements to include approved graduate courses. Additional hours may be assessed in individual cases to meet specific coursework deficiencies.

For a complete list of University Graduate School and International Education degree requirements, please visit their website at: <http://catalog.uark.edu/graduatecatalog/objectivesandregulations/>

Graduate Faculty

Allen, Bradley, Ph.D. (University of Texas at San Antonio), B.S. (Brigham Young University), Assistant Professor, 2017.
Ashton, Dub, Ph.D. (University of Georgia), M.B.A., B.S.B.A. (Memphis State University), Associate Professor, 1981.
Burton, Scot, Ph.D. (University of Houston), M.B.A., B.S.B.A. (University of Texas), Distinguished Professor, 1993.
Chen, Jialie, Ph.D. (Cornell University), B.A. (Shanghai University of Finance and Economics), Assistant Professor, 2018.
Cox, Nicole R., M.B.A. (University of Arkansas), B.S. (College of the Ozarks), Instructor, 2003.
Gauri, Dinesh K., Ph.D., M.A. (State University of New York-Buffalo), M.S. (Indian Institute of Technology, New Delhi), Professor, 2016.
Jensen, Molly R., Ph.D., M.A. (University of Arkansas), B.S. (Southwest Missouri State University), Clinical Associate Professor, 2003.
Jensen, Sarah D., Ed.D. (University of Arkansas), M.B.A., B.A. (Webster University), Instructor, 2009.
Jensen, Thomas D., Ph.D., M.A., B.A. (University of Arkansas), Professor, 1982.
Kopp, Steven W., Ph.D. (Michigan State University), M.B.A. (University of Southern Mississippi), B.S. (University of Missouri-Rolla), Associate Professor, 1992.
Murray, Jeff B., Ph.D. (Virginia Polytechnic Institute and State University), M.A., B.A. (University of Northern Colorado), Professor, 1989.
Rapert, Molly, Ph.D. (University of Memphis), M.B.A., B.S.B.A. (University of Arkansas), Associate Professor, 1991.
Smith, Ronn J., Ph.D. (Washington State University), M.S., B.S. (Montana State University), Associate Professor, 2006.
Soysal, Gonca, Ph.D. (Northwestern University), M.S. (Northwestern University), M.E. (University of Florida), B.S. (Middle East Technical University), Assistant Professor, 2017.
Stassen, Robert E., Ph.D., M.B.A. (University of Nebraska-Lincoln), B.S. (University of Minnesota), Associate Professor, 1989.

Taylor, Jennifer, Ph.D. (University of Missouri-Kansas City), M.A. (University of Northern Iowa), B.A. (University of Kentucky), Research Professor, 2014.

Velliquette, Anne M., Ph.D. (University of Arkansas), M.A.B., B.S. (Southwest Missouri State University), Clinical Assistant Professor, 2014.

Villanova, Daniel, Ph.D. (Virginia Tech University), B.S.B.A. (Appalachian State University), Assistant Professor, 2018.

Courses

MKTG 5103. Introduction to Marketing. 3 Hours.

Introduction to marketing concepts and practices as applied to the retail consumer environment. Focuses on the strategic development, positioning, and management of products, promotion, distribution, pricing, and store environments in building customer relationships from retailer and supplier perspectives. (Core) (Typically offered: Fall and Spring) May be repeated for degree credit.

MKTG 5223. Marketing. 3 Hours.

Product management, market research, marketing communications, retailing and distribution, consumer behavior, and social and ethical implications of marketing. (Typically offered: Fall)

MKTG 5333. Retailing Strategy and Processes. 3 Hours.

Strategic planning and operation of retailing organizations. Investigation of the various types of retailing with emphasis on both the strategic and functional aspects in retail processes. (Typically offered: Spring)

MKTG 5433. Consumer and Market Research. 3 Hours.

Modern marketing research methods and analyses applied to consumers, shoppers, and buyers of goods and services sold in competitive retail environments. Attention is given to both quantitative and qualitative methods, analyses, interpretation, and decision making. Prerequisite: MKTG 5103. (Typically offered: Fall)

MKTG 5523. Marketing Analytics. 3 Hours.

This course is intended to teach students how to use data analytics to improve marketing decision making at every stage of the Strategic Marketing Process. The focus will be on the skills and tools needed to obtain, process, and analyze data to formulate and answer critical marketing questions and make managerial recommendations. This is a hands-on course that employs real-world databases, lectures, cases, and exercises. Prerequisite: MKTG 5103. (Typically offered: Spring)

MKTG 5553. New Product Development and Strategy. 3 Hours.

Behavioral and social science concepts applied to retail shoppers, buyers, and consumers of products and services. Attention is given to research on the cognitive, affective, and experiential aspects involved in the acquisition, consumption, and disposal of products and services by individuals and households. Prerequisite: MKTG 5103. (Typically offered: Irregular)

MKTG 5563. Retail Strategy. 3 Hours.

The purpose of this course is to investigate the changing landscape of the retail industry. It should be noted that 'retail' is an incredibly broad topic covering everything from consumer insights to supply chain to sales management. Retail is currently experiencing somewhat of a revolution as companies experiment with new technology, innovative ways to make shopping more enjoyable, or ways of engaging the customer in a way they are not likely to forget. This course will be based on identification and discussion of new trends that emerge in the retail environment. Prerequisite: MKTG 5223. (Typically offered: Spring)

MKTG 636V. Special Problems in Marketing. 1-6 Hour.

Individual research problems. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MKTG 6413. Special Topics in Marketing. 3 Hours.

Seminar in special topics in marketing. Topics vary depending upon the instructor. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MKTG 6433. Seminar in Research Methods. 3 Hours.

Extensive review of literature illustrative of marketing research studies. Focuses upon theoretical foundations of research design, methodology, and analysis as well as interpretation of univariate, bivariate, and multivariate data in marketing theory exploration. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MKTG 6443. Seminar in Marketing Theory. 3 Hours.

Comprehensive survey and critical review of the history of marketing thought and contemporary schools of thought in marketing discipline. In-depth research, review, synthesis, and a research proposal will be required in a selected topic from the perspectives of advancing marketing theory. (Typically offered: Irregular)

MKTG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

M.B.A./M.P.S. Program

Requirements for the concurrent M.B.A./M.P.S. Degrees: Students interested in obtaining both the Master of Business Administration (M.B.A.) and the Clinton School of Public Service Master of Public Service (M.P.S.) degrees may pursue both degrees concurrently. The programs require separate application and admission to both the Clinton School of Public Service and the Graduate School of Business M.B.A. program. Students participating in the M.B.A./M.P.S. programs concurrently must file a degree plan for both degrees and obtain prior approval to take courses to be used for reciprocal credit. Interested students should obtain applications from both the Walton College Graduate School of Business and the Clinton School of Public Service.

Supply Chain Management (SCMT)

Brian Fugate
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John Alysious
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Brian Fugate
M.S. Program Director
355 Business Building
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Degrees Conferred:

M.S. Supply Chain Management
Ph.D. in Business Administration (BADM)

Program Descriptions: The Master of Supply Chain Management is designed for early-career supply chain professionals who want to return to school to receive advanced, specialized training in supply chain management. The degree is grounded in an understanding of the increasing complexity and breadth of the supply chain discipline, and within this context students will apply statistics, statistical modeling, forecasting techniques, operations research techniques, optimization, mathematical techniques, stochastic approaches, operations analysis, and the design and testing of evaluation models. Effective supply chain management also necessitates cross-functional expertise. Thus, students will choose to specialize in concentrations to complement their

supply chain courses, such as Business Analytics, Enterprise Resource Planning, Retail Supply Chain Management, and Blockchain Enterprise Systems.

The Ph.D. Program in Business Administration with an area of study in Supply Chain Management prepares individuals for academic careers in research, teaching and service at universities. The program imparts knowledge of the theoretical and substantive areas of supply chain management, as well as of conceptual skills and methodological tools, and prepares students to conduct independent research.

Requirements for M.S. in Supply Chain Management with Business Analytics Concentration

Master of Supply Chain Management Website (<https://walton.uark.edu/graduate-programs/supply-chain-masters-degree/>)

Admission Requirements: The Master of Science in Supply Chain Management (SCMTMS) program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admissions Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and residents aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Additional Degree Requirements: In addition to 30 hours of required coursework, students must take a comprehensive exam. The comprehensive exam will take the form of the final project in SCMT 5623. An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Supply Chain Management Core Courses (21 hours)

SCMT 5623	Supply Chain Innovation and Technology	3
SCMT 5633	Introduction to Supply Chain Management	3
SCMT 5663	Retail and CPG Supply Chain Management	3
SCMT 5683	Supply Chain Management in Global Business	3
SCMT 5693	Predictive Supply Chain Analytics	3
ISYS 5363	Business Analytics	3
Choose one of the following:		3
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5213	ERP Fundamentals ¹	
Choose 9 hours from one of the six concentrations		9
Total Hours		30

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Upon admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all Supply Chain Management coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

Electives are chosen by the student in consultation with the SCMTMS Program Director. Approved electives (6 hours) may be any graduate course approved by the SCMTMS Program Director.

(Part Time Program): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester in a five semester program format. Students must obtain approval from the SCMTMS Program Director to enroll in more than six hours per semester.

Choose 9 hours from the following courses:		9
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5503	Decision Support and Analytics	
ISYS 5833	Data Management Systems	
ISYS 5843	Seminar in Business Intelligence and Knowledge Management	

¹ If ISYS 5213 or ISYS 5103 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the Business Analytics concentration.

Requirements for M.S. in Supply Chain Management with Enterprise Resource Planning Concentration

Master of Supply Chain Management Website (<https://walton.uark.edu/graduate-programs/supply-chain-masters-degree/>)

Admission Requirements: The Master of Science in Supply Chain Management (SCMTMS) program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admissions Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and residents aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Additional Degree Requirements: In addition to 30 hours of required coursework, students must take a comprehensive exam. The comprehensive exam will take the form of the final project in SCMT 5623. An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Supply Chain Management Core Courses (21 hours)

SCMT 5623	Supply Chain Innovation and Technology	3
SCMT 5633	Introduction to Supply Chain Management	3
SCMT 5663	Retail and CPG Supply Chain Management	3
SCMT 5683	Supply Chain Management in Global Business	3
SCMT 5693	Predictive Supply Chain Analytics	3
ISYS 5363	Business Analytics	3
Choose one of the following:		3
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5213	ERP Fundamentals ¹	
Choose 9 hours from one of the six concentrations		9
Total Hours		30

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Upon admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all Supply Chain Management coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

Electives are chosen by the student in consultation with the SCMTMS Program Director. Approved electives (6 hours) may be any graduate course approved by the SCMTMS Program Director.

(Part Time Program): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester in a five semester program format. Students must obtain approval from the SCMTMS Program Director to enroll in more than six hours per semester.

Choose 9 hours from the following courses:	9
ISYS 5103 Data Analytics Fundamentals ¹	
ISYS 5213 ERP Fundamentals ¹	
ISYS 5223 ERP Configuration and Implementation	
ISYS 5233 Seminar in ERP Development	

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Requirements for M.S. in Supply Chain Management with Blockchain Enterprise Systems Concentration

Master of Supply Chain Management Website (<https://walton.uark.edu/graduate-programs/supply-chain-masters-degree/>)

Admission Requirements: The Master of Science in Supply Chain Management (SCMTMS) program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admissions Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and residents aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Additional Degree Requirements: In addition to 30 hours of required coursework, students must take a comprehensive exam. The comprehensive exam will take the form of the final project in SCMT 5623. An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Supply Chain Management Core Courses (21 hours)

SCMT 5623	Supply Chain Innovation and Technology	3
SCMT 5633	Introduction to Supply Chain Management	3
SCMT 5663	Retail and CPG Supply Chain Management	3
SCMT 5683	Supply Chain Management in Global Business	3

SCMT 5693	Predictive Supply Chain Analytics	3
ISYS 5363	Business Analytics	3
Choose one of the following:		3
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5213	ERP Fundamentals ¹	
Choose 9 hours from one of the six concentrations		9
Total Hours		30

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Upon admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all Supply Chain Management coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

Electives are chosen by the student in consultation with the SCMTMS Program Director. Approved electives (6 hours) may be any graduate course approved by the SCMTMS Program Director.

(Part Time Program): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester in a five semester program format. Students must obtain approval from the SCMTMS Program Director to enroll in more than six hours per semester.

Choose 9 hours from the following courses:	9
ISYS 5133 Blockchain and E Business Development	
ISYS 5173 Blockchain Fundamentals	
ISYS 5213 ERP Fundamentals ²	
ISYS 5453 Blockchain and Enterprise Data	

¹ With approval of the M.S. Program Director for Supply Chain Management, any 4000-level course may be taken for graduate credit.

² If ISYS 5213 or ISYS 5103 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the Business Analytics concentration.

Requirements for M.S. in Supply Chain Management with Finance Concentration

Master of Supply Chain Management Website (<https://walton.uark.edu/graduate-programs/supply-chain-masters-degree/>)

Admission Requirements: The Master of Science in Supply Chain Management (SCMTMS) program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admissions Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and residents aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Additional Degree Requirements: In addition to 30 hours of required coursework, students must take a comprehensive exam. The

comprehensive exam will take the form of the final project in SCMT 5623.

An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Supply Chain Management Core Courses (21 hours)

SCMT 5623	Supply Chain Innovation and Technology	3
SCMT 5633	Introduction to Supply Chain Management	3
SCMT 5663	Retail and CPG Supply Chain Management	3
SCMT 5683	Supply Chain Management in Global Business	3
SCMT 5693	Predictive Supply Chain Analytics	3
ISYS 5363	Business Analytics	3
Choose one of the following:		3
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5213	ERP Fundamentals ¹	
Choose 9 hours from one of the six concentrations		9
Total Hours		30

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Upon admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all Supply Chain Management coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

Electives are chosen by the student in consultation with the SCMTMS Program Director. Approved electives (6 hours) may be any graduate course approved by the SCMTMS Program Director.

(Part Time Program): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester in a five semester program format. Students must obtain approval from the SCMTMS Program Director to enroll in more than six hours per semester.

Required Courses

FINN 5223	Financial Markets & Valuation	3
FINN 5303	Advanced Corporate Financial Management	3
Choose one of the following:		3
FINN 5173	Energy Finance and Risk Management	
FINN 5333	Investment Theory and Management	
ACCT 5223	MBA Accounting Analysis	
ECON 5243	Managerial Economics	

¹ With approval of the M.S. Program Director for Supply Chain Management, any 4000-level course may be taken for graduate credit.

Requirements for M.S. in Supply Chain Management with Strategy and Human Resources Concentration

Master of Supply Chain Management Website (<https://walton.uark.edu/graduate-programs/supply-chain-masters-degree/>)

Admission Requirements: The Master of Science in Supply Chain Management (SCMTMS) program is open to students who have earned a bachelor's degree from an accredited institution and who can present

evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admissions Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and residents aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Additional Degree Requirements: In addition to 30 hours of required coursework, students must take a comprehensive exam. The comprehensive exam will take the form of the final project in SCMT 5623. An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Supply Chain Management Core Courses (21 hours)

SCMT 5623	Supply Chain Innovation and Technology	3
SCMT 5633	Introduction to Supply Chain Management	3
SCMT 5663	Retail and CPG Supply Chain Management	3
SCMT 5683	Supply Chain Management in Global Business	3
SCMT 5693	Predictive Supply Chain Analytics	3
ISYS 5363	Business Analytics	3
Choose one of the following:		3
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5213	ERP Fundamentals ¹	
Choose 9 hours from one of the six concentrations		9
Total Hours		30

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Upon admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all Supply Chain Management coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

Electives are chosen by the student in consultation with the SCMTMS Program Director. Approved electives (6 hours) may be any graduate course approved by the SCMTMS Program Director.

(Part Time Program): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester in a five semester program format. Students must obtain approval from the SCMTMS Program Director to enroll in more than six hours per semester.

Choose 9 hours from the following courses:		9
MGMT 4263	Organizational Change and Development ¹	
MGMT 4953	Organizational Rewards and Compensation ¹	
MGMT 5223	Business Leadership and Ethics	
MGMT 5313	Strategic Management	

¹ With approval of the M.S. Program Director for Supply Chain Management, any 4000-level course may be taken for graduate credit.

Requirements for M.S. in Supply Chain Management with Retail Concentration

Master of Supply Chain Management Website (<https://walton.uark.edu/graduate-programs/supply-chain-masters-degree/>)

Admission Requirements: The Master of Science in Supply Chain Management (SCMTMS) program is open to students who have earned a bachelor's degree from an accredited institution and who can present evidence of their ability to do graduate work. "Evidence of ability" means superior grade-point average, an acceptable test score on the Graduate Management Admissions Test (GMAT) or Graduate Record Exam (GRE), and recommendations with respect to ability for successful pursuit of graduate-level work. International applicants and residents aliens must submit an acceptable TOEFL or IELTS score, or complete the Intensive English Language Program (Spring International Language Center) and receive an English proficiency recommendation for admission. Other admissions criteria can be considered on a case by case basis.

Additional Degree Requirements: In addition to 30 hours of required coursework, students must take a comprehensive exam. The comprehensive exam will take the form of the final project in SCMT 5623. An individual's grade of B or above in the project will be considered a pass on the comprehensive exam.

Supply Chain Management Core Courses (21 hours)

SCMT 5623	Supply Chain Innovation and Technology	3
SCMT 5633	Introduction to Supply Chain Management	3
SCMT 5663	Retail and CPG Supply Chain Management	3
SCMT 5683	Supply Chain Management in Global Business	3
SCMT 5693	Predictive Supply Chain Analytics	3
ISYS 5363	Business Analytics	3
Choose one of the following:		3
ISYS 5103	Data Analytics Fundamentals ¹	
ISYS 5213	ERP Fundamentals ¹	
Choose 9 hours from one of the six concentrations		9
Total Hours		30

¹ If ISYS 5103 or ISYS 5213 is taken for the Supply Chain Management core, it will not count toward the 9 hours required for the following concentrations: Business Analytics, Enterprise Resource Planning, or Blockchain Enterprise Systems.

Upon admission, the student must maintain a 3.00 grade-point average on all graduate coursework and all Supply Chain Management coursework. Additionally, the student must receive a letter grade of at least a "B" in 75 percent of the courses attempted.

Electives are chosen by the student in consultation with the SCMTMS Program Director. Approved electives (6 hours) may be any graduate course approved by the SCMTMS Program Director.

(Part Time Program): The Walton College also provides an opportunity for professionals in the workplace to complete the program by taking 6 hours per semester in a five semester program format. Students must obtain approval from the SCMTMS Program Director to enroll in more than six hours per semester.

Choose 9 hours from the following courses:		9
MKTG 5223	Marketing	
MKTG 5433	Consumer and Market Research	

MKTG 5523	Marketing Analytics
MKTG 5553	New Product Development and Strategy
MKTG 5563	Retail Strategy

Ph.D. in Business Administration (Supply Chain Management)

Program Requirements

The PhD program is composed of 70 credit hours. Up to 3 credit hours of prior coursework may be applied to the requirements for the Business Administration (Supply Chain Management) field of study with the recommendation and consent of the student's Ph.D. Program Advisory Committee.

Required Courses

SCMT 601V	Graduate Colloquium	12
Students will enroll in the departmental doctoral colloquium (SCMT 601V) each semester. In addition, students will be expected to complete two summer research papers during the first and second summer term.		
WCOB 6111	Seminar in Business Administration Teaching I	1
Select five courses from the following:		15
SCMT 6413	Fundamentals of Logistics and Supply Chain Management	
SCMT 6433	Supply Chain Management Research	
SCMT 6443	Theory in Supply Chain Management	
SCMT 6453	Behavioral Supply Chain Management	
SCMT 6463	Research in Retail Supply Chain Management	
SCMT 6473	Emerging Topics in Supply Chain Management	
SCMT 6483	Supply Chain Economics	

Supporting Fields 9

Research Requirements 15

Select five courses from the following:

ISYS 5203	Experimental Design ^{prior course work may be applied toward this requirement}
ISYS 5723	Advanced Multivariate Analysis
ECON 6613	Econometrics I
ECON 6623	Econometrics II
ECON 6633	Econometrics III
MKTG 6433	Seminar in Research Methods

Dissertation

SCMT 700V	Doctoral Dissertation	18
Total Hours		70

Supporting Courses

Courses for the supporting fields requirement are made in consultation with the student's Ph.D. Program Advisory Committee. All courses taken for the supporting fields must be at the graduate level and/or taken for graduate credit. A minimum of six hours should be taken in graduate research seminars.

Candidacy Exam

Students must take a candidacy examination at the end of their second year in the program. The exam will have two components: a written component that will be administered over a two-day period, and an oral

exam. Successful completion of both parts of the comprehensive exam are required for admission to candidacy.

Students must complete a minimum of 72 graduate credit hours beyond the bachelor's degree and 42 graduate credit hours beyond the master's degree. Additional hours may be assessed in individual cases to meet specific coursework deficiencies.

Find a complete list of the university's Graduate School degree requirements (p. 424).

Graduate Faculty

Aloysius, John, Ph.D. (Temple University), B.S. (University of Colombo, Sri Lanka), Professor, 1995.

Dobrzykowski, David, Ph.D. (University of Toledo), Associate Professor, 2019.

Esper, Terry L., Ph.D., M.B.A. (University of Arkansas), B.A. (Philander Smith College), Associate Professor, 2013.

Fugate, Brian, Ph.D., M.B.A., B.S. (University of Tennessee), Professor, 2015.

Hofer, Christian, Ph.D. (University of Maryland University College), B.A. (European School of Business), Associate Professor, 2007.

Hyatt, David Graham, M.B.A., B.S.B.A. (University of Arkansas), Research Associate Professor, 2011.

Murphey, William C., M.S. (National Defense University), M.A. (George Washington University), Instructor, 2014.

Nelms, Carrie, M.A. (University of Arkansas), Instructor, 2019.

Rossiter-Hofer, Adriana, Ph.D. (University of Maryland-College Park), M.S. (Federal University of Rio de Janeiro, Brazil), B.S. (Federal University of Pernambuco, Brazil), Associate Professor, 2008.

Salmon, Jessica Ruth, M.B.A. (Penn State University), Instructor, 2019.

Scott, Marc, Ph.D. (North Dakota State University), M.S., B.S. (South Carolina State University), Clinical Assistant Professor, 2016.

Shook, Carole, M.S.B.A., B.S.B.A. (University of Arkansas), Instructor, 1999.

Slay, Christy Melhart, Ph.D. (University of Arkansas), Research Associate, 2019.

Sodero, Annibal Camara, Ph.D. (Arizona State University), M.S.C. (Warkwick University), B.S.C. (UFMG-Brazil), Assistant Professor, 2013.

Thomas, Rodney W., Ph.D., M.B.A. (University of Tennessee), B.S.B.A. (Greensboro College), Associate Professor, 2017.

Van Hoek, Remko, Ph.D. (University of Utrecht), M.B.A. (London School of Economics), B.S.B.A. (Vanderbilt University), Clinical Professor, 2018.

Waller, Matthew A., Ph.D., M.S. (Pennsylvania State University), B.S. (University of Missouri–Columbia), Professor, 2002.

Williams, Brent D., Ph.D., M.S. (University of Arkansas), B.A. (Lyon College), Associate Professor, 2011.

Williams, Donnie F., Ph.D. (Georgia Southern University), Clinical Assistant Professor, 2019.

Courses

SCMT 5123. Sustainable Logistics and Supply Chain Management. 3 Hours.

Explores key sustainability concepts across supply chain functions of supply management, operations, and distribution. Course topics include values-based leadership, globalizing sustainability, marketing sustainability, voluntary product standards and governance, stakeholder engagement, reverse logistics, humanitarian logistics, and transportation. Overall, we will consider the feasibility and role of firms in producing sustainability in global supply chains. (Typically offered: Irregular)

SCMT 5133. Quantitative Methods and Decision Making. 3 Hours.

Utilization of information, quantitative techniques, and computer application in decision making and problem solving for managers. (Typically offered: Fall)
This course is cross-listed with ISYS 5403.

SCMT 560V. Special Topics in Logistics. 1-6 Hour.

Explores current events, concepts, and new developments in the field of logistics and transportation. Topics are selected by the Marketing and Transportation faculty for each semester the course is offered. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCMT 5623. Supply Chain Innovation and Technology. 3 Hours.

This course explores innovation as a strategy to improve existing and/or invent new supply chain processes which ultimately create and/or maintain competitive advantage. Open, reverse, disruptive, incremental and breakthrough innovation concepts are explored. Design thinking is utilized to facilitate critical customer centric thinking about supply chains resulting in innovative solutions by inventing new or improving on existing processes, intellectual property, technologies, and systems. Leadership assessment techniques will be utilized to create diverse and inclusive cross-functional teams focused on current industry projects. (Typically offered: Fall and Spring)

SCMT 5633. Introduction to Supply Chain Management. 3 Hours.

Supply chain management is the integration of key business processes from end user through suppliers. The focus of this course is on the core processes that must be linked throughout the supply chain with an emphasis on logistics processes. Foundational topics in logistics and supply chain management will be covered. (Typically offered: Fall and Spring)

SCMT 5643. Transportation Strategies in the Supply Chain. 3 Hours.

This course focuses on the setting of objectives and the design of optimal transportation strategy and alternative means of implementing transportation strategies within different types of organizations. (Typically offered: Fall)

SCMT 5653. Global Logistics and Supply Management. 3 Hours.

This course examines the planning and management of logistics, but emphasizes supplier selection and development, logistics options, strategic alliances, and performance measurement. Emphasis is placed on the integration of purchasing, materials management, and multi-firm logistics planning. International logistics is also addressed within each of these topics. Prerequisite: SCMT 5633. (Typically offered: Irregular)

SCMT 5663. Retail and CPG Supply Chain Management. 3 Hours.

This course examines the planning and management of supply chain activities including supplier selection and development, demand management, quick response, vendor managed inventory, logistics options, strategic alliances, and performance measurement. Emphasis is placed on the integration of purchasing, materials management, and multi-firm logistics planning. (Typically offered: Fall and Spring)

SCMT 5673. Modeling Retail & Consumer Products Logistics. 3 Hours.

This is a more quantitative approach to measuring logistics performance, modeling tradeoffs and making decisions. Topics include forecasting, inventory management, network optimization, and transportation routing. Prerequisite: SCMT 5633. (Typically offered: Irregular)

SCMT 5683. Supply Chain Management in Global Business. 3 Hours.

Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. To achieve its objectives, logistics management requires the integration of business processes within and across organizations in a supply chain. Using hands on projects and class discussions based on case studies and current press articles, this course will expose participants to logistics management challenges faced by member organizations of retail supply chains competing in an omni-channel environment transformed by radical changes in consumer behavior, technology, and globalization. Prerequisite: SCMT 5663. (Typically offered: Spring)

SCMT 5693. Predictive Supply Chain Analytics. 3 Hours.

This course will introduce students to the variety and sources of data available from different technology-enabled sources, and through cases, expose them to innovative ways in which firms are using this data to improve supply chain management processes. The course will survey standard and advanced analytical techniques used to transform this data into actionable business intelligence and students will gain hands-on experience with these techniques. They will gain an understanding of the practical considerations that arise in real-world applications by means of projects. (Typically offered: Fall)

SCMT 601V. Graduate Colloquium. 1-6 Hour.

This course familiarizes students with academic and professional issues in the discipline of supply chain management with exposure to current research and contemporary research practices, current industry trends, the publication process, professional service opportunities, and pedagogical issues. Prerequisite: Admission to the PhD program in Supply Chain Management. (Typically offered: Fall and Spring)

SCMT 636V. Special Topics in Supply Chain Management. 1-6 Hour.

Independent reading and investigation in supply chain management. Prerequisite: Doctoral standing. (Typically offered: Fall, Spring and Summer)

SCMT 6413. Fundamentals of Logistics and Supply Chain Management. 3 Hours.

Introduces students to the key substantive areas of logistics and supply chain management. Offers a combination of lectures covering topics such as inventory control and forecasting and seminars discussing associated academic literature. Prerequisite: Admission to doctoral program. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCMT 6433. Supply Chain Management Research. 3 Hours.

Introduces students to major streams of SCM research and discusses the interest and merit of the research question(s), the appropriateness of the theoretical framework and/or hypothesis development, the adequacy of the research design, including data collection, measurement, and analysis (methodology), the accuracy of the discussion of the results. Prerequisite: Admission to doctoral program. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCMT 6443. Theory in Supply Chain Management. 3 Hours.

Provides an overview of theories from fields such as strategic management and marketing and explores applications of these theories to supply chain management research. Emphasis is placed on the development of theoretically grounded testable hypotheses in the context of a broad range of SCM research areas. Prerequisite: Admission to doctoral program. (Typically offered: Irregular)

SCMT 6453. Behavioral Supply Chain Management. 3 Hours.

Focuses on human behavior in supply chain management. Topics may include but will not be restricted to behavior in inventory and ordering processes, in retail store execution, in global supply chain management, in the face of adversity and catastrophic supply chain risk, and in supply chain relationships. Prerequisite: Admission to doctoral program. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCMT 6463. Research in Retail Supply Chain Management. 3 Hours.

Focuses on retail-related supply chain management research. Seminar topics may include but will not be restricted to retail sales and order forecasting, inventory management, and store execution issues. Prerequisite: Admission to doctoral program. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCMT 6473. Emerging Topics in Supply Chain Management. 3 Hours.

Covers various emerging topics, such as information technology applications in the supply chain, humanitarian logistics, supply chain security, and individual-level decision-making in the supply chain. Prerequisite: Admission to doctoral program. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCMT 6483. Supply Chain Economics. 3 Hours.

This course familiarizes students with economic concepts and philosophies underlying the organization of economic activity in the discipline of supply chain management. Enables students to evaluate, critique, and judge the quality of scholarly supply chain research that is grounded on economic principles and ideas. Provides training in developing supply chain research grounded in economic principles and ideas into an academic paper. Prerequisite: Admission to PhD program in Supply Chain Management. (Typically offered: Fall and Spring)

SCMT 700V. Doctoral Dissertation. 1-18 Hour.

Dissertation studies in supply chain management. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Admissions

Anyone who wishes to earn graduate-level credit, whether as a degree-seeking or non-degree-seeking student, must make formal application to, and be officially admitted by the Graduate School.

The Graduate School offers two classifications of admission:

Degree-Seeking

This enrollment will allow degree credit to be earned if the degree program also accepts the student.

Non-Degree Seeking

This enrollment will not lead to a degree, but may earn a graduate certificate.

Application. Please submit an online application (<https://application.uark.edu/>). You may pay the nonrefundable application fee by credit card at the time of application, or you may opt to pay later. You will be able to upload the required supporting items in your *Application Portal* upon submission of the online application.

Official academic records (transcripts) may be mailed to:

GRADUATE AND INTERNATIONAL ADMISSIONS OFFICE
340 N. Campus Drive, 213 Gearhart Hall
1 University of Arkansas
Fayetteville, AR 72701
Telephone: 479-575-6246

OR

Official electronic transcripts may be submitted directly from your school's records office to gradapp@uark.edu.

Our institution code for electronic submission of GRE test scores from Educational Testing Service (ETS) is 6866. Other graduate-level

standardized tests (such as MAT and GMAT) may be submitted in lieu of the GRE, if accepted by the degree program.

Transcripts. It is the responsibility of those applicants who desire full graduate standing to request from each college or university which the student has previously attended an official copy of the student's academic record including all courses, grades, and credits attempted and indication of degree(s) earned. Official transcripts should be sent directly to the applicant to be included in the self-managed application package. The applicant must not open the envelopes as transcripts not in the original, sealed envelopes will not be considered official. If choosing to scan and send transcripts, students will be required to submit the official transcript(s) by mail before registration for classes will be allowed.

NOTE: The fact that courses completed at one institution may be included on a transcript from another institution will not suffice; official transcripts must be received from each institution previously attended. However, applicants with an earned post-baccalaureate graduate degree (excluding professional degrees) from a regionally accredited institution may submit an official copy of the transcript conferring the baccalaureate degree and the transcript confirming the post-baccalaureate degree. For applicants with an earned post-baccalaureate degree: A degree program may require transcripts from every institution attended in pursuit of the baccalaureate degree even though the Graduate School Admissions Office does not. Please check with the degree program for specific requirements.

All transcripts become the property of the University of Arkansas Graduate School and will not be released to the applicant or to any other person, institution, or agency.

Standardized Test Scores: All degree-seeking applicants to the University of Arkansas Graduate School must submit scores on a standardized exam that is acceptable to the degree program, unless exempted by the degree program or the Graduate School. Standardized examination scores will not be required for any of the non-degree categories of admission, including admission to graduate certificate programs.

Deadlines. The University should receive all application materials, including all official transcripts, at least one month prior to the date of registration. Absolute deadlines for admission consideration are: Fall semester, Aug. 1; Spring semester, Dec. 1; Summer sessions, April 15. International applicants must have all materials submitted by April 1 for fall semester admission, by Oct. 1 for the spring semester, and by March 1 for the summer session, but it is recommended that all materials required for application be received by the admissions office at least nine months before the applicant wishes to begin his/her studies.

Applications received after the deadline, including non-degree and readmits, will be deferred to the next available semester. Many departments/programs have earlier application deadlines. The recommended deadline for fall semester graduate assistantship consideration is Feb. 1, although departments/programs may have earlier deadlines.

Previously Enrolled or Currently Enrolled at Fayetteville. For those previously enrolled or currently enrolled at the University of Arkansas, Fayetteville, the Graduate School obtains transcripts from the Registrar's Office. For a graduate of the University of Arkansas, Fayetteville (baccalaureate degree), the only transcripts required are those from the University of Arkansas, Fayetteville, and those from each institution attended after completing the University of Arkansas, Fayetteville, degree. Anyone who was previously enrolled but who is

not currently enrolled in the University of Arkansas Graduate School is required to submit official transcripts from institutions attended after the University of Arkansas Graduate School enrollment. (See Admission Classification: Readmission.) All requirements for the master's and specialist degrees must be completed within six years; all requirements for the doctoral degree must be completed within seven years. Absence from the University does not change these time limits.

Admission is for a Specific Semester Only. Applicants who wish to change their date of entry after submitting an application must notify the Graduate School Admissions Office; applicants who have already been admitted should also notify the program in which they plan to major. Application materials for applicants who apply for admission but who do not subsequently enroll will be retained by the Graduate School Admissions Office for one calendar year from the date of the applicant's original proposed semester of entry. However, applicants must file a new Application for Admission (no fee) to notify the Graduate School of their request for reconsideration. Applicants who are admitted but do not enroll for one year or more after admission must submit an application for admission, application fee, and have an official copy of the student's academic record sent from each college or university attended and follow procedures for initial admission.

Admission to Graduate Standing. Official notice of the decision concerning admission will be sent from the Graduate School. Admission will not be granted until all requirements are met, and graduate credit will not be granted retroactively except as specified in the Retroactive Graduate Credit Policy. Further, admission to graduate standing does not automatically constitute admission to a specific program of study leading to a graduate degree. Therefore, in addition to satisfying the general requirements of the Graduate School, applicants must comply with the program requirements and have the approval of the program in which they desire to pursue graduate study. It should be emphasized that students may not earn graduate credit in any course unless they have been admitted to the Graduate School.

Adviser. At the time of admission to a degree program of the Graduate School, the student is assigned to a major adviser. The appointment of the adviser is made in the student's major program and is determined primarily by the student's particular areas of interest in the field. Detailed information regarding the student's program of study may be secured from the appropriate department chairperson or program director.

Non-Native Speakers of English. All applicants, regardless of citizenship, whose first language is not English, must submit a minimum score of 6.5 on the International English Language Testing System (IELTS), 79 on the Internet-based Test of English as a Foreign Language (TOEFL), 58 on the Pearson Test of English - Academic (PTE-A), 3.9 on the International Test of English Proficiency-Academic (iTEP), or 176 on the Cambridge Assessment English C1 Advanced (C1 Advanced) taken within the preceding two years, unless they have received a graduate degree from an accredited U.S. graduate school, or they have demonstrated an acceptable level of language proficiency as defined in the Graduate School Handbook located on the Graduate School Web site. Individual departments may have higher requirements, and reference should be made to program descriptions. Students applying to a Ph.D. program in the Sam M. Walton College of Business must submit one of these tests at the time of admission.

Non-native speakers of English, regardless of citizenship, even if eligible for a TOEFL waiver, must demonstrate competency in both spoken and written English to be eligible for a graduate assistantship that requires direct contact with students in a teaching or tutorial role, in a traditional

classroom setting or via distance education. Competency in spoken English may be demonstrated by submitting a test score of at least 7 on the IELTS (speaking) sub-test, 26 on the Internet-based TOEFL (speaking) sub-test, 71 on the PTE-A (speaking) sub-test, 4.5 on the iTEP (speaking) sub-test, 185 on the C1 Advanced (speaking) sub-test, or “pass” on the Spoken Language Proficiency Test (SLPT). Competency in written English may be demonstrated by either 1) submitting a test score of at least a 6.0 on the IELTS (writing) sub-test, 26 on the Internet-based TOEFL (writing) sub-test a 71 on the PTE-A (writing) sub-test, a 4.5 on the iTEP (writing) sub-test, a 185 on the C1 Advanced (writing) sub-test; a 4.0 on the GRE (analytical writing) sub-test, a 4.5 on the GMAT (writing) sub-test, or a 75 on the English Language Proficiency Test (ELPT) OR 2) by concurrently enrolling in ELAC 5033 Research Writing for Non-Native Speakers OR ELAC 5043, Research Writing in the STEM Fields, and ELAC 0011 Writing Workshop: Grammar through Editing. Option 2 is available via placement by test scores (5.5 IELTS writing sub-test, 23 Internet-based TOEFL writing sub-test, 3.5 GRE or 4.0 GMAT analytical writing subtest, 62 PTE-A writing subtest, 3.5 on the iTEP writing sub-test, 162 on the C1 Advanced writing sub-test, or 70 on the ELPT). The Graduate Coordinator or Department Chair/program Director must request option 2. Students applying to a Ph.D. program in the Sam M. Walton College of Business must submit one of these spoken English tests (above) at the time of admission.

English Language Use by Non-Native Speakers. Applicants, regardless of citizenship, whose first language is not English and who are admitted to graduate study at the University of Arkansas, are required to present an acceptable score on one of the following tests: TOEFL (Writing), IELTS (writing), PTE-A (writing), iTEP (writing), C1 Advanced (writing), GRE (analytical writing), GMAT (analytical writing) or ELPT (writing). Depending upon exam scores, a student may be required to take one or more ELAC course(s) during their first term of study. Students may be required to take the English Language Placement Test (ELPT) prior to the beginning of classes in their first term of study. Non-native speakers in the following categories are exempt from this requirement, although individual departments may require any of these tests for admission. (Please note that those students who will be in graduate assistantships in which they will have direct contact with students in a teaching or tutorial role must still demonstrate proficiency in spoken English, even if they qualify for one of these exemptions.)

1. Graduate students who earned bachelor's or master's degrees in U.S. institutions or in foreign institutions where the official and native language is English;
2. Graduate students with an Internet-based TOEFL writing score of 29, IELTS writing score of 7.0, PTE-A writing score of 80, iTEP writing score of 4.5, or C1 Advanced writing score of 185.
3. Graduate students with a 4.5 on the analytical writing portion of the GRE or a 5.0 on the writing portion of the GMAT.

Diagnostic and placement testing is designed to test students' ability to use English effectively in an academic setting, and its purpose is to promote the success of non-native speakers in completing their chosen course of study at the University of Arkansas. Test results provide the basis for placement into English Language and Culture (ELAC) support courses or course sequences. Courses are offered by the Graduate School and International Education for those students whose language skills are diagnosed as insufficient for college work at the level to which they have been admitted (undergraduate or graduate study). Credit in ELAC courses may not count toward University of Arkansas degrees. Non-native speakers diagnosed as having language competence

sufficient for their level of study will not be required to enroll in ELAC courses.

The ELPT is administered by Testing Services during New Student Orientation and there is a \$15 charge. Graduate students assessed course work as a result of performance on the ELPT, TOEFL writing, IELTS writing, PTE-A writing, iTEP writing, C1 Advanced writing, GRE or GMAT analytical writing will be required to complete the ELAC course(s) to support initial course work taken in their fields. Graduate departments/degree programs will have the discretion to waive either the requirement for the language evaluation or the required language courses.

The publication, “International Student Information,” is available from the Graduate and International Admissions Office, 213 Gearhart Hall, 1 University of Arkansas, Fayetteville, Arkansas 72701.

Classifications of Admission to Graduate Standing

Full Graduate Standing, Regular Admission. To be considered for full graduate standing, regular status, applicants must have earned a baccalaureate or a master's degree from the University of Arkansas, Fayetteville, or from a regionally accredited institution in the United States with requirements for the degrees substantially equivalent to those of this University, or from a foreign institution with similar requirements for the degrees. Admission to graduate standing does not automatically constitute acceptance to a program of study leading to a graduate degree. To pursue a graduate degree, a person must also be accepted in a program of study after gaining regular admission to graduate standing. International applicants cannot be admitted to graduate standing unless they are also accepted by a degree program at the same time.

Persons who achieve regular admission but are not initially seeking a graduate degree (non-degree) and who subsequently decide to pursue a degree must apply for and be accepted in a degree program by the Graduate School. A student with regular graduate standing who has not been accepted in a program of study leading to a specific graduate degree may take no more than 12 semester hours of graduate-level courses that can be counted toward the requirements for a graduate degree (six for graduate certificate programs). At the time of acceptance in a degree program, the chair of the appropriate department or program director will recommend to the Graduate School which courses previously taken, if any, are to be accepted in the degree program.

Students with a documented history of an academic integrity violation may be denied admission by the program but will be given an opportunity to explain the violation as defined by the program.

Requirements for admission to graduate standing and acceptance in a program of study leading to a graduate degree are:

1. For admission to graduate standing:
 - a. A grade-point average of 3.0 or better (A=4.00) on the last 60 hours of course work taken prior to receipt of a baccalaureate degree from a regionally accredited institution of higher education; or
 - b. Conferral of a post-baccalaureate graduate degree (excluding professional degrees) from a regionally accredited institution; and
 - c. A score on a standardized examination (e.g. Graduate Record Examination, Miller Analogies Test, Praxis, Graduate Management Admission Test) that is acceptable to the degree program, unless exempted by the degree program or the Graduate School.

2. For acceptance to a graduate degree program the requirements are as follows:

- a. Fulfillment of either 1.a or 1.b, and and 1.c, if required, and recommendation of the chair of the department or program offering instruction for the degree program; or
- b. Fulfillment of 1.b, recommendation of the chair of the department or program offering instruction for the degree program and approval of the Graduate Dean. The student must also meet any other conditions that may be specified by the faculty of the department.

Any other consideration for admission must be by individual petition to the Graduate Dean and, where pertinent, a recommendation from the appropriate program chair. Each petition will be considered on its own merits, case by case. Program requirements should be considered the minimum for admission to a degree program but do not guarantee admission. That is, fully qualified applicants who are accepted by the Graduate School will not necessarily be accepted into the degree program of their choice. It is the responsibility of the program faculty to allocate program resources in the most effective manner. To accomplish this, the program may not be able to accept every qualified applicant.

Non-Degree Seeking. If a student meets all of the requirements for regular admission to the Graduate School but chooses not to pursue a degree, he/she may be admitted as non-degree seeking. If the student subsequently chooses to pursue a degree, only 12 of the hours taken as a non-degree-seeking student may be used to fulfill degree requirements, and those 12 hours must be approved by the advisory committee.

Non-Consecutive One Term Admission, NON-DEGREE Standing. Applicants who desire admission standing allowing them to enroll in non-consecutive single semesters must obtain from the Graduate School Admissions Office and must sign a statement of understanding. Students admitted to such non-consecutive one-term admissions must understand that any enrollment taken in this classification will not normally carry degree credit. Transcripts are not required for applicants seeking this non-degree standing.

Visiting Graduate Students. A graduate student who is in good standing at another accredited institution may be given admission (non-degree status) to the Graduate School for one semester (renewable) upon submission of an Application for Admission and a letter of good standing from the Dean of the Graduate School at that institution. If the student's first language is not English, TOEFL requirements will apply, but programs may petition for a student to be admitted without the TOEFL score. If, sometime in the future, the student should wish to pursue a degree in the University of Arkansas Graduate School, it will be necessary to follow the normal procedures for admission, to have official transcripts sent from each institution previously attended, and to submit a TOEFL score, if appropriate.

Readmission. Readmission to the Graduate School is not automatic. Students must meet each of the following criteria and are also strongly encouraged to ensure that an adviser in the department/program is still available to them. Post-candidacy doctoral students who have not been enrolled in the preceding year must be acceptable by the program for readmission.

1. Students who have been enrolled in the Graduate School within the five preceding academic years but have not enrolled in the immediately preceding semester will be readmitted if:

- a. The student has earned at least a 2.85 cumulative grade-point average on all graduate credits attempted during all previous enrollments;
- b. Former students seeking to resume their graduate degree program should complete the "Request for Reactivation of Enrollment" form and submit the reactivation fee. A new Application for Admission Form (and application fee) is required of students seeking admission to begin a new graduate program. In both cases, paperwork must be filed prior to the desired registration date (preferably at least one month prior to that date);
- c. The Graduate School has received an official transcript of all course work attempted at other institutions subsequent to the previous enrollment in the University of Arkansas Graduate School;
- d. An official standardized test score acceptable to the degree program is on file in the Graduate School; and
- e. The student's graduate status at the end of the previous enrollment was "good standing."

2. All requirements for the master's and specialist degrees must be completed within six years of the first enrollment used for the degree; all requirements for the doctoral degree must be completed within seven years from the original date of the Record of Progress. Absence from the University does not change these time limits. Students may petition for extensions to these time limits only if the course work was completed at the University of Arkansas (Fayetteville).
3. Students who have been previously admitted to and enrolled in the Graduate School but have no enrollment within the five years preceding the semester of readmission and who wish to be readmitted to pursue a graduate degree, may be considered for readmission upon a petition by the degree program to the Graduate School. Such students should contact the department/program head/director or graduate coordinator to request readmission. The department/program head/director, graduate coordinator, or major adviser of the student will petition the Director of Graduate Admissions, using the form "Request for an Exception to the Admissions Requirements of the Graduate School," and will specify whether all of the student's previous course work and grade points will be forfeited. (Note: Neither the degree program nor the student may petition to forfeit only some of the previous course work and grade points; rather, all or none of the course work may be forfeited.) If all of the previous course work and grade points will be forfeited, a notation on the transcript next to these courses will state: "This course may not be used for graduate credit at the University of Arkansas." If the previous course work and grade points will not be forfeited, the student's major adviser must petition for a time extension. Please see the Time Extension Policy.
4. Readmission for non-degree seeking students: Non-degree-seeking students who have previously been enrolled in the Graduate School but have had a lapse in their enrollment will follow the procedures stated above, or in the policy pertaining to non-consecutive one-term admissions, whichever is most appropriate.
5. Readmission to the Graduate School under any other circumstances will be considered and decided on an individual basis. Students interested in obtaining such readmission should contact the Graduate School. Students who were not enrolled in the Spring semester, but who were enrolled for the Summer session will have registration materials available for the Fall semester should they wish to continue their registration.

Retroactive Graduate Credit

Degree Programs

Graduate students fully admitted into a degree program at the University of Arkansas may request that up to 12 hours of courses taken in the final 12-month period of their undergraduate degree count toward their graduate degree, if these courses were taken on the University of Arkansas, Fayetteville campus. These courses may not have been used for the undergraduate degree (unless the student is in a program where this has been approved by the Graduate Council), must be approved by the student's advisory committee, and must be at the 5000 level or above. Petition will be by the student's advisory committee or major professor to the Graduate School.

Sometimes students have completed their undergraduate degrees elsewhere, but have then taken course work as undergraduate students at the University of Arkansas after completing their undergraduate degree, but before being admitted to the Graduate School. Such students may request that up to six hours of courses taken for undergraduate credit in the final 12 months prior to admission to the Graduate School count toward their degrees. All of the rules stated in this policy are also applicable to this type of situation.

If the student's advisory committee wishes to accept courses at the 4000 level toward the graduate degree, when those courses were taken in the last 12 months of a student's undergraduate degree at the University of Arkansas, Fayetteville, the committee may petition the Graduate School. The petition must include an explanation of why the committee considers these courses to meet graduate degree requirements and expectations for graduate-level work. The instructors for these courses must have had graduate faculty status, and these courses may not have been used for the undergraduate degree.

Courses at the 3000 level taken before the student is fully admitted to the Graduate School may not be used to fulfill graduate degree requirements.

Courses offered by institutions other than the University of Arkansas, Fayetteville, may not be counted toward the graduate degree requirements in this way.

Graduate Certificates

Graduate students fully admitted to a graduate certificate program are allowed to use six hours of credit to count for both an undergraduate degree and a graduate certificate. All requirements of this retroactive graduate credit policy will apply and a transcript notation will note that the courses may not be used to fulfill requirements for a graduate degree.

Admission to Graduate Centers

In an attempt to fulfill the recognized need for graduate education for Arkansas residents who find it impossible or inconvenient to attend classes at Fayetteville, the University of Arkansas Graduate School offers selected graduate-level courses at graduate centers throughout the state.

All courses and instructors at these centers have been individually evaluated by the University of Arkansas Graduate Council and are subject to the same standards of quality that apply to graduate faculty and graduate programs at Fayetteville.

Similarly, those desiring to enroll in these courses must follow the same admission procedures and are subject to the same admission criteria as persons admitted at Fayetteville. There are no exceptions or deviations from these policies and procedures. Admission materials, including all official transcripts, should be received in the Graduate School at least

one month prior to the requested semester of entry. (See section on "Admission.")

For more comprehensive information regarding format of instruction, schedule of classes, enrollment and registration, fees, etc., contact the Global Campus, 2 E. Center St., Fayetteville, AR 72701; 1-800-952-1165.

Those intending to enroll for classes at the Graduate Resident Center for Engineering (University of Arkansas at Little Rock, host campus) must submit application for admission to the Graduate School at least one month prior to initial registration through:

Graduate Resident Center for Engineering
3189 Bell Engineering Center
University of Arkansas
Fayetteville, AR 72701
Telephone: 1-800-423-1176 or 479-575-6015

To assure timely processing of the Application for Admission, a check or money order made to the University of Arkansas for the \$60 application fee must accompany the application when submitted to the Graduate School.

Contact the above address for information pertaining to classes, enrollment, fees, etc.

Graduate Centers

The University of Arkansas offers graduate-level courses for residence credit at Graduate Centers located off the Fayetteville campus. There are two types of graduate centers currently in existence: Twelve-Hour Graduate Centers and Graduate Resident Centers.

Graduate courses completed at Graduate Resident Centers may be used to satisfy course work requirements for any graduate degree. Any graduate credit course offered by the University of Arkansas, Fayetteville, via distance education (regardless of class sites) will be counted as residence credit.

Twelve-Hour Graduate Centers. The University of Arkansas, Fayetteville, offers graduate courses at off-campus locations. At those locations, not defined as Graduate Resident Centers for specified degrees, a student may complete a maximum of twelve semester hours of courses for residence credit applicable to the master's degree requirements at the University of Arkansas.

To obtain graduate credit for courses offered at off-campus locations, the student must gain admission to the University of Arkansas, Fayetteville, Graduate School. If graduate credit so received is to be applied to a specific master's degree, the student must be accepted in a program of study leading to that degree. Graduate courses completed, but not applicable to the requirements for the master's degree the student is pursuing, will not be accepted as part of the 30-week residence required for that degree.

Graduate Resident Centers. The University of Arkansas offers graduate level courses for residence credit off the Fayetteville campus. All of the residence requirements for some graduate degrees may be completed off campus at Graduate Resident Centers as indicated in the following list.

- **Graduate Resident Centers at Military Bases and the downtown Little Rock Graduate Resident Center**
The Master of Science in Operations Management (M.S.O.M.) is offered at Graduate Resident Centers established at the Naval Support Activity Mid-South in Millington, Tennessee; the Hurlburt Field

Air Force Base in Florida; and at the downtown Little Rock location.

For further information on this degree program and a description of courses offered, see the Operations Management page.

• **University of Arkansas Clinton School**

All course requirements for the Master of Public Service may be completed at a combination of the University of Arkansas Clinton School of Public Service, the University of Arkansas at Little Rock, the University of Arkansas for Medical Sciences, and the University of Arkansas, Fayetteville.

The following table provides a brief outline of minimum requirements for admission to a degree program and for graduation from the program.

See the Objectives and Regulations chapter and each degree program for full information about admission and graduation requirements.

Degree Program	Degree Abbr.	Test Req. for Admission	Letter of Rec.	Department Application & Admission Requirements	Dissertation or Thesis Required	Foreign Language Required for Grad.
Accounting (p. 372) ¹	M.Acc.	GMAT	3B	B	No	No
Accounting (p. 372) ¹	Ph.D.	GMAT	3B	B	Yes	No
Adult and Lifelong Learning (p. 13)	Ed.D.	GRE	No	Y	Yes	No
Adult and Lifelong Learning (p. 13)	M.Ed.	GRE	No	Y	No	No
Agricultural Economics (p. 19)	M.S.	GRE	3	Stmnt of Purpose	Opt	No
Agricultural and Extension Education (p. 23)	M.S.	GRE or MAT	Yes	No	Opt	No
Agricultural (p. 25), Food and Life Sciences (p. 25)	M.S.	Opt.	No	No	No	No
Animal Science (p. 26)	M.S.	GRE	3	No	Opt	No
Animal Science (p. 26)	Ph.D.	GRE	3	No	Yes	No
Anthropology (p. 29)	M.A.	GRE	3	B	Opt	No
Anthropology (p. 29)	Ph.D.	GRE	3B	Yes	Yes	Yes
Art (p. 33)	M.F.A.	No	3	B+Images	Yes	No
Athletic Training (p. 39)	M.A.T.	GRE	3	Essay	Opt	No
Biological Engineering (p. 47)	Ph.D.	GRE	3	Yes	Yes	No
Biological Engineering (p. 47) ⁴	M.S.B.E.	GRE	3	Yes	Yes	Opt
Biology (p. 42)	M.S.	G	3	Yes	Yes	No

Biology (p. 42)	Ph.D.	G	3	Yes	Yes	No
Biomedical Engineering (p. 51)	M.S.B.M.E.	GRE	3	Yes	Yes	No
Biomedical Engineering (p. 51)	Ph.D.	GRE	3	Yes	Yes	No
Business Administration (p. 380) ¹	M.B.A.	GMAT, GRE	3B	B	Yes	No
Business Administration (p. 380) ¹	Ph.D.	GMAT	3B	B	Yes	No
Career and Technical Education (p. 55)	M.Ed.	GRE	No	No	Opt	No
Cell and Molecular Biology (p. 56)	M.S.	GRE	Yes	Yes	Yes	No
Cell and Molecular Biology (p. 56)	Ph.D.	GRE	Yes	Yes	Yes	No
Chemical Engineering (p. 60)	Ph.D.	GRE	Opt	Yes	Yes	No
Chemical Engineering (p. 60) ⁴	M.S.Ch.E.	GRE	Opt	Yes	Opt.	No
Chemistry (p. 62)	M.S.	GRE	3	No	Yes	No
Chemistry (p. 62)	Ph.D.	GRE	3	No	Yes	No
Civil Engineering (p. 65)	Ph.D.	GRE	3	No	Yes	No
Civil Engineering (p. 65) ⁴	M.S.C.E.	GRE	No	No	Opt	No
Clinical Occupational Therapy (p. 245)	O.T.D.					
Communication Sciences and Disorders (p. 72)	M.S.	GRE	Yes	Centralized Electronic Application	No	No
Communication (p. 70)	M.A.	GRE	3	Writing Sample +Stmnt of Goals	Opt	No
Community Health Promotion (http://catalog.uark.edu/graduatecatalog/programs/stcommunityhe)	M.S.	GRE	No	Stmnt of Purpose	Opt	No
Community Health Promotion (http://catalog.uark.edu/graduatecatalog/programs/stcommunityhealthpromotion/clpmsphd/)	Ph.D.	GRE	3	CV+Stmnt of Purpose	Yes	No

Comparative Literature and Cultural Studies (p. 76)	M.A.	GRE	3	B	Opt	Yes	
Comparative Literature and Cultural Studies (p. 76)	Ph.D.	GRE	3	B	Yes	Yes	
Computer Engineering (p. 83)	Ph.D.	GRE	3	Stmt of Purpose	Yes	No	
Computer Engineering (p. 83) ⁴	M.S.Cmp.E.	GRE	3	Yes	Opt	No	
Computer Science (p. 83)	M.S.	GRE	3	Stmt of Purpose	Opt	No	
Computer Science (p. 83)	Ph.D.	GRE	3	Stmt of Purpose	Yes	No	
Counseling (p. 90)	M.S.	No	3B	Yes	Opt	No	
Counselor Education and Supervision (p. 90)	Ph.D.	GRE	3B	Yes	Yes	No	
Creative Writing (p. 95)	M.F.A.	GRE	3B	B	Yes	No	
Crop (p. 96), Soil and Environmental Sciences (p. 96)	M.S.	No	3	Stmt of Purpose+3 ref letters	Yes	No	
Crop (p. 96), Soil and Environmental Sciences (p. 96)	Ph.D.	No	3	Stmt of Purpose+3 ref letters	Yes	No	
Curriculum and Instruction (p. 98)	Ed.S.	GRE	No	No	No	No	
Curriculum and Instruction (p. 98)	M.Ed.	GRE	No	No	No	No	
Curriculum and Instruction (p. 98)	Ph.D.	GRE	3	Yes	Yes	No	
Economics (p. 384) ¹	M.A.	GRE	3B	B	Opt	No	
Economics (p. 384) ¹	Ph.D.	GRE	3B	B	Yes	No	
Education Policy (p. 109)	Ph.D.	GRE	2	B	Yes	No	
Educational Leadership (p. 113)	Ed.D.	GRE	3B	Yes	Yes	No	
Educational Leadership (p. 113)	Ed.S.	GRE, SLLA	3B	Yes	No	No	
Educational Leadership (p. 113)	M.Ed.	No	No	No	Opt	No	
Educational Statistics and Research Methods (p. 116)	Ph.D.	GRE	Opt	Yes	Yes	No	
Educational Technology (p. 118)	M.Ed.	No	3	Yes	Opt	No	
Electrical Engineering (p. 119)	Ph.D.	GRE	3	Stmt of Goals	Yes	No	
Electrical Engineering (p. 119) ⁴	M.S.E.E.	GRE	3	Stmt of Goals	Opt	No	
Elementary Education (p. 124)	M.A.T.	No	No	Yes	No	No	
Engineering (p. 127)	M.S.	Opt.	No	B	No	No	
English (p. 128)	M.A.	GRE	3B	B+Writing Sample +Stmt of Purpose	Opt	Yes	
English (p. 128)	Ph.D.	GRE	3	B	Yes	Yes	
Entomology (p. 136)	M.S.	GRE	3	CV and	Yes	No	
Entomology (p. 136)	Ph.D.	GRE	3	Stmt of Goals	Yes	Opt	
Environmental Dynamics (p. 138)	Ph.D.	GRE	3	B+Writing Sample +Stmt	Yes	No	
Environmental Engineering (p. 142) ⁴	M.S.En.E	GRE	No	No	Opt	No	
Finance (p. 388) ¹	Ph.D.	GMAT	3B	B	Yes	No	
Food Science (p. 144)	M.S.	GRE	2	Stmt of Purpose	Yes	No	
Food Science (p. 144)	Ph.D.	GRE	2	Stmt of Purpose	Yes	No	
French (p. 328)	M.A.	No	Yes	No	No	No	
Geography (p. 148)	M.A.	No	3	Yes	Yes	No	
Geology (p. 148)	M.S.	No	3	No	Yes	No	
Geosciences (p. 148)	Ph.D.	GRE	3	Yes	Yes	No	
German (p. 328)	M.A.	No	3	Writing Sample +Stmt of Purpose	No	No	
Health (p. 158), Sport and Exercise Science (p. 158)	Ph.D.	GRE	3	CV+Stmt of Interest	Yes	No	
Higher Education (p. 161) ³	Ed.D.	GRE, MAT	3B	Yes	Yes	No	

Higher Education (p. 161) ³	M.Ed.	GRE	3B	Yes	Opt	No						
History (p. 164)	M.A.	GRE	3	B	Yes	No						
History (p. 164)	Ph.D.	GRE	3	B	Yes	Yes						
Horticulture (p. 172)	M.S.	Opt	3	No	Yes	No						
Human Environmental Sciences (p. 175)	M.S.	GRE	3	No	Opt	No						
Human Resource and Workforce Development Education (p. 178)	Ed.D.	GRE	No	Yes	Yes	No						
Human Resource and Workforce Development Education (p. 178)	M.Ed.	GRE	No	No	No	No						
Industrial Engineering (p. 181)	Ph.D.	GRE	3	CV+Stmnt of Purpose	Yes	No						
Industrial Engineering (p. 181) ⁴	M.S.I.E.	GRE	3	CV+Stmnt of Purpose	Opt	No						
Information Systems (p. 392) ¹	M.I.S.	GMAT, GRE	3B	B	No	No						
Information Systems (p. 392) ¹	Ph.D.	GMAT, GRE	3B	B	Yes	No						
Journalism (p. 185)	M.A.	GRE	3	CV +Stmnt of Purpose	Yes	No						
Kinesiology (http://catalog.uark.edu/graduatecatalog/programsofstudies/kinesiologykin)	M.S.	GRE	No	No	Opt	No						
Kinesiology (http://catalog.uark.edu/graduatecatalog/programsofstudies/kinesiologykinsmsphd/)	Ph.D.	GRE	3	CV+Stmnt of Purpose	Yes	No						
Management (p. 398) ¹	Ph.D.	GMAT, GRE	3B	B	Yes	No						
Marketing (p. 401) ¹	Ph.D.	GMAT, GRE	3B	B	Yes	No						
Mathematics (p. 217)	M.S.	GRE	3	Stmnt of Purpose	Opt	No						
Mathematics (p. 217)	Ph.D.	GRE	3	Stmnt of Purpose	Yes	No						
Mechanical Engineering (p. 222)	M.S.	GRE	Yes	CV+Stmnt of Purpose	Yes	No						
Mechanical Engineering (p. 222)	Ph.D.	GRE	Yes	CV+Stmnt of Purpose	Yes	No						
Mechanical Engineering (p. 222) ⁴	M.S.M.E.	GRE	Yes	CV+Stmnt of Purpose	Opt	No						
Microelectronics Photonics (http://catalog.uark.edu/graduatecatalog/programsofstudies/microelectronicsphotonicsmeph/)	M.S.	P	3	B	P	No						
Microelectronics Photonics (http://catalog.uark.edu/graduatecatalog/programsofstudies/microelectronicsphotonicsmeph/)	Ph.D.	P	3	B	Yes	No						
Music (p. 226)	M.M.	No	Opt	Dept Placemt Test	Opt	No						
Nursing (p. 238)	M.S.N.	No	No	Yes	Opt	No						
Operations Management (p. 252)	M.S.O.M.	No	No	No	No	No						
Philosophy (p. 257)	M.A.	Opt	3	Yes	Yes	No						
Philosophy (p. 257)	Ph.D.	Opt	3	Yes	Yes	Yes						
Physical Education (p. 259)	M.Ed.	No	No	No	No	No						
Physics (p. 260)	M.A.	P	3	B	No	No						
Physics (p. 260)	M.S.	P	3	B	Yes	No						
Physics (p. 260)	Ph.D.	P	3	B	Yes	No						
Plant Pathology (p. 266)	M.S.	GRE	3	Yes	Yes	No						
Plant Science (http://catalog.uark.edu/graduatecatalog/programsofstudies/plantsciencesc/)	Ph.D.	GRE	3	Yes	Yes	No						
Political Science (p. 269)	M.A.	GRE	3	Writing Sample	Opt	No						
Poultry Science (p. 272)	M.S.	GRE	3	Yes	Yes	No						
Poultry Science (p. 272)	Ph.D.	GRE	3	Yes	Yes	No						
Psychology (p. 275)	M.A.	GRE	3B	Yes	Yes	No						
Psychology (p. 275)	Ph.D.	GRE	3B	Yes	Yes	No						
Public Administration (p. 278)	M.P.A.	GRE	3	Writing Sample	No	No						
Public Policy (p. 281)	Ph.D.	GRE	3	Yes	Yes	No						
Recreation and Sport Management (p. 287) ³	Ed.D.	GRE	3	CV+Stmnt of Purpose	Yes	No						
Recreation and Sport Management (p. 287) ³	M.Ed.	GRE	No	CV+Stmnt of Purpose	Opt	No						

Secondary Education (p. 321) ²	M.A.T.	GRE	3	Yes	No	No
Secondary Mathematics (p. 217)	M.A.	No	No	No	Opt	No
Social Work (p. 299)	M.S.W.	GRE for below 3.0 GPA. No test for 3.0 GPA or above	3	Yes	Opt	No
Sociology (p. 304)	M.A.	GRE	2, 3P	Writing Sample +Stmt of Interest	Opt	No
Space and Planetary Sciences (p. 306)	M.S.	Opt	2	Yes	Yes	No
Space and Planetary Sciences (p. 306)	Ph.D.	Opt	2	Yes	Yes	No
Spanish (p. 328)	M.A.	No	No	No	No	No
Special Education (p. 310)	M.Ed.	No	No	Yes	No	No
Statistics and Analytics (p. 318)	M.S.	No	No	No	No	No
Supply Chain Management (p. 402)	Ph.D.	GMAT	3B	B	Yes	No
Teacher Education (p. 321) ²	M.A.T.	Praxis II	3	Yes	No	No
Teaching English to Speakers of Other Languages (p. 323)	M.Ed.	No	2	Stmnt of Purpose +Optional Writing Sample	Opt	No
Theatre (p. 324)	M.F.A.	No	3	Yes	Yes	No

1. Non-departmental students must obtain permission from department to register for courses in these fields.
 2. An Educational Specialist degree is available in this area of study. See Curriculum and Instruction (p. 98).
 3. A Doctor of Education degree is available in this area of study. See Curriculum and Instruction (p. 98).
 4. A Doctor of Philosophy degree in Engineering is available in this area of study. See Engineering (p. 127).
- P Preferred
 Opt Optional
 A International applicants only
 B Forms obtained from and returned to department
 G General test
 S Subject area test

Fee and General Information

Educational expenses will vary according to a student's course of study, personal needs, and place of residence. Student progress or

general course of action in pursuit of higher education at the University of Arkansas is determined during the application and acceptance process. At the conclusion of the application and acceptance process, the progress or general course of action for each student will be assigned a category, called a career.

The career categories at the University of Arkansas — in order of magnitude by the cost of tuition per credit hour — are Agricultural & Food Law, Law, Graduate, and Undergraduate. Students concurrently enrolled in multiple careers will be assigned one primary career for all tuition billing purposes, called a billing career, based on the order of magnitude listed above. The Office of the Registrar is responsible for assigning the appropriate billing career. Students pursuing an Undergraduate career will also be classified by undergraduate program. The undergraduate programs of College of Education and Health Professions' plan of Nursing and the Fay Jones School of Architecture and Design's undergraduate program of Architecture have specific tuition rates, while all other undergraduate programs are the Undergraduate tuition rate. Similar to career, although a student may be concurrently enrolled in multiple undergraduate programs, the Office of the Registrar will assign each student only one primary undergraduate program for tuition billing purposes based on the order of magnitude by the cost of tuition per credit hour. All fees, charges, and costs quoted in this catalog are subject to change without notice. A survey tool for tuition and fee estimation is available at the Treasurer's website (<http://treasurer.uark.edu/Tuition.asp?pagestate=Estimate>).

Financial obligations to the University of Arkansas must be satisfied by the established deadlines. Payment may be made at the university Cashier's Office in the Arkansas Union, Room 214, by cash, personal check, money order or certified check. Echeck (electronic check) and credit/debit payments are made online at UAConnect (<http://uaconnect.uark.edu>). If you pay with a debit or credit card, there is a convenience fee charged of 1.8 percent.

Acceptance of payment for fees does not imply academic acceptance to the university.

Estimated Necessary Expenses for an Academic Year

Estimates of necessary expenses for the 2019-20 academic year for a typical graduate student taking 24 credit hours at the University of Arkansas:

Fee	Graduate Resident	Graduate Non-Resident
Tuition *	\$10,336.00	\$28,042.00
University Fees**	\$1,452.00	\$1,452.00
Books	\$1,100.00	\$1,100.00
Personal Expenses	\$2,856	\$2,856
Transportation	\$2,238.00	\$2,238.00
Room***	\$7,290.00	\$7,290.00
Board***	\$4,040.00	\$4,040.00
TOTAL****	\$29,312.00	\$47,018.00

* The standard graduate in-state tuition rate is \$430.69 per credit hour. Students enrolled in College of Business courses are charged \$ 587.46 per credit hour in-state tuition. Students enrolled in College of Engineering courses are charged \$503.91 per credit hour in-state tuition. Nursing students are charged \$573.99 per credit hour in-state tuition.

- ** University fees per year include the following student-initiated and student-approved fees:
 Student Activity fee, \$2.64/credit hour — \$63.36
 Student Health fee, \$7.25/credit hour — \$174.00
 Media fee, \$0.88/credit hour — \$21.60
 Transit fee, \$3.02/credit hour — \$74.16
 Network Infrastructure and Data Systems fee, \$10.73/credit hour — \$258.72
 Facilities fee, \$17.10/credit hour — \$452.40
 Library fee, \$2.84/credit hour — \$69.84
 College of Arts and Sciences fee, \$13.77/credit hour — \$338.64
- *** Weighted average expenses for living in a residence hall, double occupancy, with an unlimited meal plan. Actual room and board fees vary.
- **** Budget amounts were adjusted for rounding to accommodate UAConnect budgetary rules.

When paying tuition, room and board, and associated fees, anticipated financial aid for a current semester may be deducted when it is listed as anticipated aid on the student's account. Students receiving financial aid are strongly encouraged to have sufficient personal funds available to purchase books and to meet necessary expenses for at least one month at the start of school as some aid funds may not be available for disbursement.

The latest information regarding costs and other aspects of university life may be obtained by calling or writing the Office of Graduate and International Recruitment, 213 Gearhart Hall, 1 University of Arkansas, Fayetteville, AR 72701. In Arkansas, call 479-575-6246; from outside of Arkansas, call toll-free 1-866-234-3957.

Tuition Fees

Students classified as "in-state" for fee payment purposes are assessed tuition. Students classified as "out-of-state" for fee payment purposes are assessed additional non-resident tuition.

Official policies of the University of Arkansas Board of Trustees provide the basis for classifying students as either "in-state" or "out-of-state" for purposes of paying student fees. Board policies relating to residency status for fee payment purposes are included at the end of this chapter of the catalog. Out-of-state students who question their residency classification are encouraged to contact the Registrar's Office, 146 Silas H. Hunt Hall, for more information about residency classification review procedures.

Academic Year

Graduate students are assessed tuition of \$430.69 per credit hour. Students with out-of-state residency status are assessed tuition of \$1,168.40 per credit hour.

Graduate students enrolled in the Walton College of Business courses are charged tuition of \$587.46 per credit hour in-state and \$1,593.70 per credit hour for out-of-state students.

Graduate students enrolled in College of Engineering courses are charged tuition of \$503.91 per credit hour in-state and \$1,367.03 per credit hour for out-of-state students.

Graduate nursing students are assessed tuition of \$573.99 per credit hour. Students with out-of-state residency status are assessed tuition of \$1,557.16 per credit hour.

Graduate occupational therapy students are assessed tuition of \$450.00 per credit hour. Students with out-of-state residency status are assessed tuition of \$1,218.34 per credit hour.

Graduate students enrolled in the specific distance education programs of Master of Science in Engineering (M.S.E.), Master of Science in Electrical Engineering (M.S.E.E.), Master of Science in Engineering Management (M.S.E.M.), and Master of Science in Operations Management (M.S.O.M.) are assessed tuition of \$303.88 per credit hour for in-state and out-of-state residency status.

Graduate students enrolled in the specific distance education program of Great Plains and Agricultural Interactive Distance Education Alliance are assessed tuition of \$580.00 per credit hour for in-state and out-of-state residency status.

Graduate students enrolled in the specific distance education program of Master of Science in Food Safety are assessed tuition of \$500.00 per credit hour for in-state and out-of-state residency status.

Fee Adjustments

A currently enrolled student who has registered during the advance registration period should make any necessary or desired schedule adjustments such as adding or dropping courses or changing course sections during the schedule-adjustment period of the same semester. Students who drop classes will have their fees adjusted according to Fayetteville Policies and Procedures 330.0 – Tuition and Fee Adjustment Policy for Dropping Classes (<https://vcfa.uark.edu/policies/fayetteville/avcf/3300.php>). Drops and withdrawals are two different functions. In a drop process, the student remains enrolled. The result of the withdrawal process is that the student is no longer enrolled for the term. Fee adjustment deadlines for an official withdrawal are noted in Fayetteville Policies and Procedures 518.0 – Tuition and Fee Adjustment Policy for Official Withdrawal (<https://vcfa.uark.edu/policies/fayetteville/avcf/5180.php>).

Student Invoices

Students who pre-register for a semester will be invoiced approximately six weeks prior to the first day of classes. The Treasurer's Office will send out an e-mail notification when the student invoices are available on UAConnect. Students should log into UAConnect (<http://uaconnect.uark.edu>), navigate to the Treasurer's Office tile, and click the 'Student Invoice' link.

Late Fees

Students are required to pay all charges by the posted payment deadline. Students who fail to pay all charges or who fail to execute an installment payment plan by the deadline may be assessed a late payment fee equal to the outstanding balance, not to exceed \$75.00.

Any student with an outstanding balance, to include registration-related fees and/or housing charges, by the last payment deadline will be assessed an additional late payment fee equal to the outstanding balance, not to exceed \$75.00.

The late fee will not be waived because an invoice was not received.

Disbursement of Refunds

Disbursement of refunds due to overpayments by scholarships, loans, and/or grants will begin approximately five days prior to the start of classes. The University of Arkansas has partnered with BankMobile to

deliver financial aid and other school refunds to University of Arkansas students. For more information, visit the BankMobile reimbursement site (<http://bankmobiledisbursements.com/refundchoicessso/>).

Addresses

Students may create a check address, which will be used specifically for overpayment checks. This address may be created in addition to the local and permanent addresses. If a check address is not created, the default address will be the permanent address. The student may change their address on UAConnect (<http://uaconnect.uark.edu>) in the Student Center.

Teaching Equipment and Laboratory Enhancements Fees

These fees provide and maintain state-of-the-art classroom equipment and instructional laboratory equipment. These fees vary, based upon the student's college of enrollment.

During the regular fall, spring and summer academic semesters, these fees are assessed on a per credit hour basis.

College or School	Per Credit Hour Fee
Agricultural, Food and Life Sciences	\$25.20
Architecture General Education	\$32.60
Arts And Sciences	\$14.11
Business	\$24.50
Education And Health Professions	\$15.32
Engineering	\$42.16

Students Called into Active Military Service

When a student or student's spouse is activated for full-time military service and is required to cease attending the University of Arkansas without completing and receiving a grade in one or more courses, they shall receive compensation for the resulting monetary loss as provided by Fayetteville Policy 504.2 (<http://vcfa.uark.edu/policies/fayetteville/avcf/5042.php>). The student must cease attendance because 1) the student is activated or deployed by the military or 2) the student's spouse is activated or deployed by the military and the student or student's spouse has dependent children residing in the household.

To be eligible for the compensation, the student must provide, prior to activation or deployment for military service, an original or official copy of the military activation or deployment orders to the university's Veterans Resource and Information Center. A student whose spouse is a service member shall provide proof of registration with the Defense Enrollment Eligibility Reporting System (DEERS) of the U.S. Department of the Defense that establishes that dependent children reside in the household of the student and the service member.

Upon leaving the University of Arkansas because of active duty or deployment, the student may choose one of three compensatory options. The student may officially withdraw and receive full adjustment and refund of tuition and non-consumable fees for the term involved; the student can remain enrolled and arrange for a mark of "Incomplete" for each class and finish the courses 12 months after deactivation; or the student may receive free tuition and fees for one semester after deactivation. For more detailed information, read Fayetteville Policy 504.2 (<http://vcfa.uark.edu/policies/fayetteville/avcf/5042.php>).

Financial Assistance

Registration (in-state tuition) fees and Non-Resident Tuition for Graduate Assistants

Registration Fee. Any graduate student appointed to the position of Graduate Assistant whose appointment is equal to or greater than 50 percent may be granted registration fees (in-state tuition) in addition to the stipend.

Non-Resident Tuition. Any graduate student appointed to the position of Graduate Assistant whose percent appointment is equal to or greater than 25 percent shall, in addition to any stipend, be treated as an in-state student for tuition and fee purposes for the semester that they are on appointment.

Graduate Assistantships

Graduate assistantships are available for qualified students in numerous fields and must be obtained from the department in which the student is majoring or another appropriate unit. Recipients of these appointments are expected to carry a limited program of graduate studies. Graduate students appointed to the position of graduate assistant whose appointment is equal to or greater than 25 percent shall, in addition to any stipend, be classified as an in-state student for tuition and fee purposes only. In addition, in-state registration (tuition) fees may be paid for appointees of 50 percent or more although tuition is normally not paid for audited courses. Successful applicants must have good academic records, adequate preparation for graduate study in their major field, regular admission to the Graduate School, and must maintain a cumulative grade-point average of at least 2.85 on all work taken for graduate credit, although some departments may require their graduate assistants to maintain a higher grade point average. See probation policy below.

Graduate students on 50 percent appointment must be enrolled in a minimum of six hours of graduate credit during the academic year and a minimum of three hours during the summer if on summer appointment. For the full policy, see the Graduate School Handbook, available on the Graduate School website at grad.uark.edu (<http://grad.uark.edu/>).

Master's students may hold a graduate assistantship for no more than four major semesters; a doctoral student may hold a graduate assistantship for no more than eight major semesters; a student who enters a doctoral program with only a baccalaureate degree may hold a graduate assistantship for no more than ten major semesters. The department/program may petition the Graduate School for an extension to these time limits, on a case by case basis.

Application forms may be obtained from the Dean of the Graduate School or from the head or chair of the department in which the student seeks to do his/her major work.

Information on other financial aid (loans and employment) can be obtained at the Office of Scholarships and Financial Aid in Hunt Hall.

Graduate School Fellowships

Exceptionally promising new entrants to doctoral programs may be nominated at the time of application for University Doctoral Fellowships. These Fellowships are awarded competitively, and the stipend may be held in addition to a graduate assistantship.

Students on academic probation who have been in residence at UA Fayetteville for two or more semesters will not be allowed to receive a doctoral fellowship.

The Benjamin Franklin Lever Fellowship is designed to provide financial assistance to graduate students from under-represented groups and to provide a means by which the University can achieve greater diversity in the student body. To accomplish these purposes, the program funds a limited number of fellowships to qualified under-represented students who enroll in an on-campus program at the University of Arkansas, Fayetteville campus.

Contact the Graduate School, 346 N. Arkansas Ave., (479) 575-4401, for further information about the University Doctoral and the Benjamin Franklin Lever Fellowships.

Eligibility for Continuing Financial Aid

Graduate students are eligible for continuing financial aid through the Office of Financial Aid (e.g., student loans) if:

1. the student completes, with grades of "C" or better, 67 percent of graduate courses attempted at the University, and
2. the student has not yet completed more than 150 percent of the graduate credits required for his/her degree.

Students wishing to continue receiving financial aid who do not meet these requirements will petition the Student Aid Committee.

Academic Probation Policy for Graduate Students

Whenever a regularly admitted graduate student earns a cumulative grade-point average below 2.85 on graded course work taken in residence for graduate credit, he/she will be warned of the possibility of academic dismissal. When a graduate student has accumulated a minimum of 15 hours of graded course work taken in residence for graduate credit with a cumulative grade-point average below 2.85 and has received at least one warning, he/she will be academically dismissed from the Graduate School. This policy is effective with students entering the Graduate School in Fall 2002, or later. For the policy in effect before this time, contact the Graduate School.

Graduate teaching and research assistants and students on Lever, Doctoral, or other Graduate School fellowships must maintain a CGPA of at least 2.85 on all course work taken for graduate credit. If a student's CGPA falls below 2.85 on six or more hours of graduate work (one full-time semester), notification will be sent to the students and his/her department. If the CGPA is below 2.85 at the end of the next major semester (fall or spring), the department will not be allowed to appoint the student to an assistantship until such time as his/her CGPA has been raised to the required level.

Veteran Benefits

The University of Arkansas is approved by the Arkansas Department of Education for veterans and veterans' beneficiaries who are working toward a degree. Veterans of recent military service, service members, members of reserve units, and the dependents of certain other servicemen may be entitled to educational assistance payments under the following programs: Post 911, Title 38, Chapter 30, Montgomery GI Bill[®] for Veterans; Title 38, Chapter 32, Veterans Educational Assistance Program (VEAP); Title 38, Chapter 35, Survivors and Dependents Education; and Title 10, Chapter 106, Montgomery GI Selected Reserves.

All students must be working toward a degree and should follow the curriculum outline for their objectives since only specific courses may be applied toward VA certification and graduation. Persons eligible for educational benefits should contact the Office of the Registrar for information.

Waiver of Tuition and Fees for Senior Citizens

Arkansas residents who are 60 years of age or older and show proper proof of age may choose to have on-campus tuition and fees waived for on-campus courses under the senior citizen waiver of fees. Admission and enrollment under these conditions is open only on a "space available" basis in existing classes and students choosing to use this waiver may not register until just prior to the beginning of the term.

Room and Board

University Housing (Rates are subject to change)

Housing for married students, students with family status, nontraditional, graduate, and law students is limited and requires early application.

Summer rates for room and board in university residence halls with unlimited meal plans for 2019 summer sessions are available through the Housing Office. Charges start on the requested move-in day and run through the date of check-out. Contact University Housing for information on meal plans 479-575-3951.

Specific questions concerning on-campus living may be directed to Residence Life and Dining Services 479-575-3951. Specific questions concerning sorority and fraternity living may be directed to the Office of Greek Affairs 479-575-4001.

Off-Campus Housing

Students eligible to live off-campus may contact local real estate offices for rental information or check offcampushousing.uark.edu (<http://offcampushousing.uark.edu/>).

Other General Fee Information

Checks tendered to the university are deposited immediately. The university does not accept postdated checks. Checks returned for "insufficient funds" (NSF checks) are generally presented for payment only once. Each check returned by a bank for any reason will be assessed a returned check fee. The university may, at its discretion, verify available bank funds for any checks written for payment of indebtedness before accepting a check.

The University of Arkansas reserves the right to withhold transcripts or priority registration privileges, to refuse registration, and to withhold diplomas for students or former students who have not fulfilled their financial obligations to the University. These services may also be denied students or former students who fail to comply with the rules governing the audit of student organization accounts or to return property entrusted to them.

Requests for exceptions to the university's fees, charges, and refund policies must be made in writing. Instructions for submitting requests for exceptions to the various fees, charges, and refund policies of the University may be obtained as follows:

- For residence life and dining services fees, charges, and refund policies contact Residence Life and Dining, Attention: Assistant Director for Business, Hotz Hall, Ninth Floor, (479) 575-3951.
- For parking services fees, charges, and refund policies contact: Parking and Transit, Administrative Services Building, 155 Razorback Road, (479) 575-3507.
- For all other fees, charges, and refunds, contact the Treasurer's Office at 214 Arkansas Union, Attention: Treasurer.

Students receiving financial aid are strongly encouraged to have sufficient personal funds available to purchase books and to meet necessary expenses for at least one month at the start of school as some aid funds may not be available for disbursement.

Students are allowed to have automobiles at the university, although parking is quite limited. There is a parking permit and registration fee for each vehicle, varying in cost depending upon the parking option selected.

Fees*

Title	Description	Amount**
FACILITIES FEE	Provides support dedicated specifically to campus facilities needs, including major projects and deferred maintenance.	\$18.85
MEDIA FEE	The University's student publications, specifically the Arkansas Traveler newspaper and the Razorback yearbook, are partially funded by the media fee. Students reserving a copy are provided with a Razorback yearbook.	\$0.90
NETWORK INFRASTRUCTURE AND DATA SYSTEMS FEE	Provides support for the development and operation of the campus network, including electronic equipment, servers with software, and cabling. The network systems serve computer labs, academic and administrative buildings, residence halls and off-campus access facilities. Data systems will enable Web-based access to the University's information systems for students, faculty, and staff. Also provides support for upgrades and replacement of the student information system.	\$10.78
STUDENT ACTIVITY FEE	Empowers the Associated Student Government (ASG) to make funding available to over 300 Registered Student Organizations and program activities on campus to develop lasting friendships and leadership abilities and provide all students with a unique opportunity to participate in cultural, social, educational, and recreational events throughout the year.	\$2.64

STUDENT HEALTH FEE Covers Wellness and Health Promotion educational programs and healthy student behavior programs to maintain health and safety. Covers individual consultations with a certified wellness coach, consultation with a Registered Dietitian and consultation with an Orthopedic Specialist from the community. Student Health Fee also provides students access to sexual assault counseling, prevention and advocacy services. The Student Health Fee also covers several mental health services, such as 24-hour mental health emergency care, the cost for two intake assessments with a mental health clinician per semester, most group counseling sessions, case management/referral services, psychiatric nurse consultations, refill requests and outreach/advocacy. **\$7.25**

TRANSIT FEE Helps fund the Razorback Bus Transit System, which services the campus and neighboring community year round. **\$3.09**

LIBRARY FEE Provides additional support for library materials acquisitions **\$2.91**

* Assessed each academic semester for which the student is enrolled: fall, spring, and summer

** Per Credit Hour

Program/Service Specific Fees

Program or Service	Amount
English Language Placement Test (ELPT)	\$15.00
Graduation fees:	
• Graduation Application – Late Fee	\$25.00
• Graduate Degree	\$65.00
I.D. Card — First card	\$24.00
• Authentication fee (exclusively online students)	\$10.00
• First card (exclusively online students)	\$25.00
• Each replacement card	\$18.00
Returned Check Fee (per Fayetteville Policy 327.0)	\$31.00
Installment Payment Plan	\$35.00
International Graduate Orientation Fee	\$50.00
International Student (non-immigrant) Application fee	\$60.00
International Student per semester service fee (non-immigrants)	\$105.00
Sponsored Student Management Fee	\$360.00
International Visiting Student Program Fee	\$310.00

Visiting Student Custom Program – Level 1	\$100.00
Visiting Student Custom Program – Level 2	\$100
Late payment:	
• On September 30 or February 28 if balance has not been paid	\$75.00
• Additional fee at Nov. 30, April 30, and July 31 for fall, spring, and summer, respectively, if payment has not been made	\$75.00
Mandatory International Student Health Insurance	\$2,103.00/year
Late Registration Fee – Prior to Census Day	\$25.00
Late Registration Fee – After Census Day	\$50.00
Graduate Application Fee	\$60.00
Graduate Application Late Fee-Domestic	\$25.00
Graduate Application Late Fee-International	\$50.00
Graduate Document Processing Fee	\$30.00
Global Campus Fee	\$30.00
Global Campus Extension Fee	\$30.00
Infant Development Center for UA Student Families: (40 hrs/week)	
• Application Fee (non-refundable, one-time per child)	\$200.00
• Materials per semester	\$150.00
• Infants and 1 to 2 years old (full-time per month)	\$980.00
• Older than 2 to 3 years old (full-time per month)	\$935.00
• Older than 3 to 5 years old (full-time per month)	\$905.00
• Older than 3 to 5 years old (part-time per month)	\$555.00
Summer Camp Participants – 1st-4th grade students (full-time per week)	\$275.00
Parking Permit (per vehicle)	
• Remote	\$70.49
• Student	\$104.79
• Resident Reserved	\$679.33
• Parking Garage Reserved	\$926.00
• Motorcycle	\$70.49
• Scooter	\$70.49
• Scooter Reserved	\$211.45
Professional Liability Insurance (non-refundable, per course)	\$7.45
Professional Liability Insurance – Nurse Practitioners (non-refundable, per course)	\$23.88

Residence Hall nonrefundable application fee	\$40.00
Tests	
• IELTS Registration Fee	\$240.00
• Spoken Language Placement Test (SLPT)	\$70.00
• Late Testing Registration Fee	\$20.00
• TOEFL	\$70.00
• Miller Analogies Test (MAT)	\$80.00
• COEHP – Health Sciences Reasoning Test	\$25.00
• Premium Online Proctored Exam 'Take It Now' Fee	\$8.75
• Premium Online Proctored Exam 'Take It Soon' Fee	\$5.00
• Proctoring Fee	\$50.00
• Online Proctoring Fee for Credit by Exam	\$25.00
Transcript Fee (copy of permanent record)	\$8.00
Withdrawal from the University fee	\$45.00

College/Course Specific Fees

School of Architecture and Design

College	Course(s)	Amount
Graduate Residency Fee	Summer Semester Only	\$100.00/semester
Studio Materials Fee	FJAD 6906, FJAD 6916	\$25.00/credit hour

College of Arts and Sciences

College	Course(s)	Amount
Certificate in Business French, Le Centre de Langue François	FREN 4333, FREN 4433	\$100.00/semester
Expendable ARTS and GDES Consumables and Equipment Fee	Per credit hour for all ARTS and GDES courses	\$53.74/credit hour
Expendable MUAC, MUED and MUEN Supplies and Instrument Repair/Maintenance	All MUAC, MUED and MUEN courses	\$5.12/credit hour
Expendable THTR Supplies and Materials	Per credit hour for all THTR courses	\$20.00/credit hour
Fifth-year Internship Fee (M.A.T.)	ARED 476V, MUED 451V, MUED 452V	\$100.00/semester
One-on-One Instruction Program/Excursion Fee	All MUAP courses GEOS 437V, GEOS 537V	\$25.00/credit \$200.00/semester

College of Business

College	Course	Specific Fees
Computer Competency Assessment Test	ISYS 1120	\$58.50/course

Course Materials Fee – EMBA	Including Graduate Certificate program in Business Analytics	\$100.00/credit hour
Course Materials Fee – PMIS	Including Graduate Certificate programs in Business Analytics, Enterprise Resource Planning, and Information Systems	\$50.00/credit hour
Program Fee – EMBA	Including Graduate Certificate program in Business Analytics	\$528.39/credit hour
Program Fee – PMIS	Including Graduate Certificate programs in Business Analytics, Enterprise Resource Planning, and Information Systems	\$321.86/credit hour
Technology Fee	EMBA	\$7.00/credit hour

College of Education and Health Professions

College	Course(s)	Amount
Adult and Lifelong Learning Seminar Fee	ADLL 6173	\$23.00/credit hour
Athletic Training Clinical Rotation Fee	ATTR 5232, ATTR 5242, ATTR 5262, ATTR 5272	\$11.25/course
Communication Sciences and Disorders Clinical Fee	CDIS 4001, CDIS 5181, CDIS 5281, CDIS 5381, CDIS 599V	\$100.00/credit hour
Counseling Practicum Fee	CNED 5343, CNED 6711	\$23.00/credit hour
Counseling Internship Fee	CNED 574V, CNED 674V (section 1)	\$23.00/credit hour
Curriculum Instruction Education Internship Fee	CIED 508V, CIED 528V, CATE 5016	\$20.00/credit hour
Fifth-year Internship Fee (M.A.T.)	CIED 508V, CIED 528V, CATE 5016, SPED 532V	\$250.00/semester
Internship for Communication Disorders	CDIS 578V	\$100.00/semester
Internship Program in Education Leadership and Support for Leadership Seminars	EDLE 574V, EDLE 674V	\$20.00/semester
Literacy Clinic		
• Beginning Assessment	CIED 5173	\$20.00/course
• Methodology Fee	CIED 5013, CIED 5073, CIED 5453	\$15.00/course
• Reading Specialist	CIED 5593, CIED 5793, CIED 5963, CIED 5983, CIED 6233	\$20.00/course

Clinical Fee-DNP	NURS 5112, NURS 5332, NURS 5454, NURS 5475, NURS 5495, NURS 5683, NURS 5884, NURS 6224, NURS 6244, NURS 628V	\$145.00/credit hour
Nursing Advanced Skills Lab Fee	NURS 5475	\$130.00/semester
Off-Campus Internship: Clinical Site	CDIS 558V	\$100.00/semester
Off-Campus Practicum: Clinical Site	CDIS 568V	\$50.00/semester
Off-Campus Practicum: Public School Site	CDIS 548V	\$50.00/semester
Outdoor Adventure Leadership Fee	RESM 4023	\$35/credit hour
Rehabilitation Internship and Practicum Fee	RHAB 534V, RHAB 574V	\$75.00/semester
Special Education Lab fee, Practicum	CIED 532V	\$25.00/credit hour
Student Teaching Supervision	PHED 407V	\$30.00/semester
Teacher Excellence and Support system (TESS) Preparation Fee	EDLE 5063	\$489.00/semester

College of Engineering

College	Course(s)	Amount
Distance Technology Fee		\$50.00/credit hour
Internship Fee-Cooperative Education	GNEG 5801, GNEG 5811	\$25.00/course

Graduate Procedures

It is a student's responsibility to ascertain that requirements have been met and deadlines observed.

Degree programs may establish additional requirements.

Procedures for Master's and Specialist Degrees

Procedure	Responsible Party	Action Date
Formation of program advisory committee and submission of Master's Committee form*	Major Adviser/ Department Chair/Head	Immediately following admission to degree program for those programs that use an advisory committee

Changes in program advisory committee by memorandum or Master's Committee form	Major Adviser/Member Leaving Committee	As soon as change occurs
Request transfer of credit by submitting Request for Transfer of Graduate Credit form* (master's degrees only)	Major Adviser	Before Graduation
Graduation Application*	Student	By the following deadlines for the semester in which the degree is to be awarded: Fall - Oct. 1; Spring - March 1; Summer - July 1
Inclusion of name for commencement exercises, regalia, and announcement orders	Student	Deadlines indicated in on the Registrar's Office web page at https://registrar.uark.edu/graduation/applying-to-graduate.php
Removal of incompletes (Change of Grade form)	Student/Instructor	When course requirements have been met
To avoid an incomplete becoming "F"	Student/Instructor	Change of grade form must be submitted prior to 12 months after the end of the term in which the incomplete grade was posted.
Final comprehensive examination (Certified by submission of Record of Progress form* with original signatures)	Advisory Committee	Must be completed by last day of graduation term (published date on Registrar's page)
Review of Degree Audit	Student/Major Adviser	Each semester or as dictated by department
Clear Degree Audit	Department Head/ Graduate Coordinator	After deadline to apply for graduation
Submission of Record of Progress	Department	Due to Graduate School by one week after end of term

Additional Requirements for the Thesis Option

Procedure	Responsible Party	Action Date
Selection of thesis title and formation of thesis committee and submission of new Master's Committee form* if thesis committee differs from the advisory committee	Thesis Director/ Department Chair/Head	At least three months prior to the date of the defense
Review Thesis and Dissertation Guide from the Graduate School website	Student	Prior to formatting of thesis document
Submission of preliminary copies to each thesis committee member	Student	At least three weeks before theses are due in the Graduate School
Defense of thesis (certified by submission of Record of Progress with original signatures*)	Thesis Committee	At least two weeks before theses are due to the Graduate School
Registration for at least six hours of thesis	Student	Before graduation
Preliminary editorial check of thesis	Student	At least two weeks before theses are due in the Graduate School
Final submission of approved thesis to Graduate School	Student submits to Graduate School	No later than one week before graduation**
Review of Degree Audit	Student/Major Adviser	Each semester or as dictated by department
Clear Degree Audit	Department Head/ Graduate Coordinator	After deadline to apply for graduation
Submission of Record of Progress	Department	Due to Graduate School by one week after end of term

* Forms are available from the Graduate School website (<http://grad.uark.edu/>).

** Specific deadlines are available in the Graduate School.

Procedures for Doctoral Degrees

Procedure	Responsible Party	Action Date
Formation of program advisory committee and submission of Doctoral Committee form*	Major Adviser/ Department Chair/Head	Immediately following admission to degree program for those programs that use an advisory committee
Changes in program advisory committee by memorandum or Doctoral Committee form	Major Adviser/ Department Chair/Head	As soon as change occurs

Foreign Language Requirement (if required)	Advisory Committee	Determined by committee	Defense of dissertation (Certified by submission of Record of Progress with original signatures*)	Dissertation Committee	At least two weeks before dissertations are due to the Graduate School**
Admission to candidacy	Advisory Committee	Before beginning work on the dissertation*	Submission of preliminary copies to each dissertation committee member	Student	At the direction of the dissertation adviser
Submit Exam Notification form to Graduate School	Department	Term in which candidacy exam was passed	Preliminary editorial check of dissertation	Student	At least two weeks before dissertations are due in the Graduate School **
Enrollment in at least one hour of graded graduate course work or dissertation credit following passing of candidacy exams	Student	Each major semester (fall, spring) until graduation. Summer is excluded unless it is the term of graduation.	Final submission of approved dissertation to Graduate School	Student submits to Graduate School	No later than one week before graduation**
Selection of dissertation title and formation of dissertation committee and submission of Doctoral Dissertation Title and new Doctoral Committee form* if dissertation committee differs from advisory committee	Dissertation Director	At least three months prior to the date of the defense*	Review of Degree Audit	Student/Major Adviser	Each semester or as dictated by department
Registration for at least 18 hours of dissertation	Student	Before graduation	Clear Degree Audit	Department Head/ Graduate Coordinator	After deadline to apply for graduation
Graduation Application	Student	By the following deadlines for the semester in which the degree is to be awarded: Fall - Oct. 1; Spring - March 1; Summer - July 1	Submission of Record of Progress	Department	Due to Graduate School by one week after end of term
Inclusion of name for commencement exercises, regalia, and announcement orders	Student	Deadlines indicated on the Registrar's Office web page at https://registrar.uark.edu/graduation/applying-to-graduate.php	Procedures for Professional Doctoral Degrees		
Removal of incompletes (Change of Grade form)	Student/Instructor	When course requirements have been met	For procedures for the Doctor of Nursing Practice (p. 238) degree or the Occupational Therapy Doctor (p. 245) degree, refer to the specific program of study for degree requirements.		
To avoid an incomplete becoming "F"	Student/Instructor	Change of grade form must be submitted prior to 12 months after the end of the term in which the incomplete grade was posted.	* Forms are available from the Graduate School website (http://grad.uark.edu/).		
Review Thesis and Dissertation Guide on the Graduate School website	Student	Before formatting of dissertation document	** Specific deadlines are available in the Graduate School		
Submission of Announcement of Defense through web form on Graduate School website	Dissertation Director or student	At least two weeks before the defense**	Objectives and Regulations		

Procedures for Professional Doctoral Degrees

For procedures for the Doctor of Nursing Practice (p. 238) degree or the Occupational Therapy Doctor (p. 245) degree, refer to the specific program of study for degree requirements.

* Forms are available from the Graduate School website (<http://grad.uark.edu/>).

** Specific deadlines are available in the Graduate School

Objectives and Regulations

The Graduate School and International Education is the home for all graduate students and all international students, both graduate and undergraduate. Our vision, mission and goals encompass our dedication to the recruitment, admission, retention and graduation of students from Arkansas and across the U.S. and the world, as well as our service to the University of Arkansas. The Graduate School is an autonomous organizational unit, whose dean is responsible to the provost/vice chancellor for academic affairs. The mission statement and goals of the Graduate School may be found in the Graduate School Handbook, available at the Graduate School website (<http://grad.uark.edu/>).

Vision

The Graduate School and International Education assists the University of Arkansas in excelling at research, teaching, training, and service while fostering student and scholar success and enhancing the overall student academic experience.

Mission

The Graduate School and International Education supports the strategic goals of the University of Arkansas to continue as a very high research university; recruits, retains and graduates high-caliber students; advocates for students and student success; facilitates intercultural and

international experiences to increase global competencies; and assists in the development of international, interdisciplinary and graduate programs.

Honor Code for the Graduate School

The mission of the Graduate School is to provide post-baccalaureate students with the opportunity to further their educational goals through programs of study, teaching, and research in an environment that promotes freedom of expression, intellectual inquiry, and professional integrity. This mission is only possible when intellectual honesty and individual integrity are taken for granted.

The graduate student at the University of Arkansas is expected to know and abide by the university's academic and research integrity policies. It is expected that graduate students will refrain from all acts of academic and research dishonesty and will furthermore report to the Graduate School any acts witnessed.

The pledge of the Honor Code is this: "On my honor as a graduate student at the University of Arkansas, I certify that I will neither give nor receive inappropriate assistance on the work I do for my degree." Students will be asked to sign this pledge when they are admitted to the Graduate School. Faculty also may require students to sign this pledge before completing the requirements of a course or a program of study.

Registration and Related Topics

Students must register during one of the formal registration periods. Graduate students, new, returning, or currently enrolled, may register during the priority registration held each semester for the following semester. Students who have not already registered should register during the open registration session. For information on registration, consult the Schedule of Classes on the Registrar's website (<https://registrar.uark.edu/>).

Enrollment Limits

Under ordinary circumstances, graduate registration is limited to 18 hours for any one semester in the fall or spring, including undergraduate courses and courses audited. Registration above 15 hours must be approved by the Graduate Dean. For registration in the summer, the enrollment limit is 12 hours without approval by the Graduate Dean.

Registration for Audit

When a student audits a course, that student must register for audit, pay the appropriate fees, and be admitted to class on a space-available basis. Students formally admitted to a degree program have priority for auditing a class. The instructor shall notify the student of the requirements for receiving the mark of "AU" for the course being audited. The instructor and the student's dean may drop a student from a course being audited if the student is not satisfying the requirements specified by the instructor. The student is to be notified if this action is taken. The only grade or mark that can be given is "AU." The Graduate School does not normally pay tuition for audited classes for students on assistantship.

Registration Out of Career

Students who wish to enroll in classes for credit outside of their career (e.g. graduate students who wish to enroll in undergraduate classes for undergraduate credit) should print the appropriate form from the Graduate School Web site (<http://grad.uark.edu/>) and return the form to the office indicated on the form. Students are not able to register themselves out of career. Graduate students taking undergraduate classes via the out-of-career registration form should be aware that those classes do not count toward their minimum number of hours required to receive financial aid. Undergraduate students who register for graduate courses out of

career and subsequently are admitted to the Graduate School will not automatically be allowed to use those courses to fulfill requirements of their graduate degrees. See the policy on retroactive graduate credit.

Graduate Credit for 3000 and 4000-level Undergraduate Courses

Graduate students wishing to take 3000-level undergraduate courses for graduate credit will find the necessary forms on the Graduate School website. 3000-level courses can be taken by graduate students for graduate credit only when the courses are not in the student's major area of study and when the courses have been approved by the Dean of the Graduate School for graduate credit. The instructor for the course must hold graduate faculty status and must certify that he/she will make appropriate adjustments in assignments and grading scales to raise the level of expectation for the student to the graduate level. No more than 20 percent of the graded course work in the degree program may be comprised of 3000-level courses carrying graduate credit. Undergraduate courses numbered below 3000 will not be allowed to carry graduate credit.

Students wishing to take 4000-level undergraduate courses for graduate credit will find the necessary forms on the Graduate School website (<http://grad.uark.edu/>). The instructor for the course must hold graduate faculty status and must certify that he/she will make appropriate adjustments in assignments and grading scales to raise the level of expectation for the student to the graduate level.

Students should be aware that a minimum of 50% of the semester hours presented for the graduate degree must be at the 5000 level or above and in the student's field of study. Individual degree programs may have more stringent requirements.

Online Credit

Any student pursuing an on-campus (face-to-face) graduate degree from the University of Arkansas may take courses offered on-line or by distance, as long as the majority of credit hours presented for the degree are on-campus credit hours.

Proper Address of Students

All students are responsible for maintaining their addresses with the university and to report any change of address by update on the university's student information system (<https://uaconnect.uark.edu>). Failure to do so may result in undelivered grades, registration notices, invoices, invitations, or other official correspondence and announcements. It is also vitally important that students regularly check their university-assigned email account as many important notices will be sent by email.

Identification Cards

Identification cards are produced by the Campus Card Office during each registration period and at scheduled times and places during the year. Among other things, this card is used for identification as a member of the campus community, security access, enrollment verification, meal plan access and Razorback\$ to purchase goods and services.

Adding and Dropping Courses

A currently enrolled student who has registered during the advance registration period should make any necessary or desired schedule adjustments such as adding or dropping courses or changing course sections during the schedule-adjustment period scheduled for the same semester. Students may also add or drop courses during the first five class days of the fall or spring semester. Students who drop classes by the end of the first week of classes in the fall and spring will have their

fees adjusted. (Refer to the Treasurer's website for summer dates.) Fee adjustments are not done for classes dropped after the first week of classes. Drops and withdrawals are two different functions. In a drop process the student remains enrolled. The result of the withdrawal process is that the student is no longer enrolled for the term. The two functions have different fee adjustment policies. Fee adjustment deadlines for official withdrawal are noted on the Treasurer's website.

A student may drop a course during the first 10 class days of the fall or spring semester without having the drop shown on the official academic record. After the first 10 class days, and before the drop deadline of the semester, a student may drop a course, but a mark of "W," indicating the drop, will be recorded. A student may not drop a full-semester course after the Friday of the tenth week of classes in a semester.

Drop-add deadlines for partial semester courses and summer classes are in the schedule of classes.

Withdrawal from Registration

Withdrawing from the University of Arkansas means withdrawing from all classes that have not been completed up to that time. A student who leaves the university voluntarily before the end of the semester or summer term must officially withdraw by logging onto the student information system and completing a brief online interview. Withdrawal must occur prior to the last class day of a semester. Students who do not withdraw officially from a class that they fail to complete will receive an "F" in that class.

Attendance

Students are expected to be diligent in the pursuit of their studies and in their class attendance. Students have the responsibility of making arrangements satisfactory to the instructor regarding all absences. Such arrangements should be made prior to the absence if possible. Policies of making up work missed as a result of absence are at the discretion of the instructor, and students should inform themselves at the beginning of each semester concerning the policies of their instructors.

Full-Time Status

Enrollment in nine semester hours (not including audited courses) is considered full-time for graduate students not on assistantship. For graduate assistants on 50 percent appointment or more, or students with research fellowships, six semester hours (not including audited courses) of enrollment is considered full-time in the fall and spring semesters. Graduate assistants who are on a 50% appointment for a five-week summer term must earn at least three hours of graduate credit during the summer. However, these credits do not have to be earned in the same session as the appointment, and may be taken at any time during the summer. Tuition for graduate assistants on 50 percent appointments for a five-week summer term will be paid up to a maximum of 6 hours. Students not on graduate assistantships or fellowships must be enrolled in six hours (not including audited courses) to be full time in the summer.

Continuous Enrollment

After a doctoral student has passed the candidacy examinations, the student must register for at least one hour of graded graduate course credit or dissertation credit each fall and spring semester until the work is completed, whether the student is in residence or away from the campus. For each semester in which a student fails to register without prior approval of the Dean of the Graduate School, a registration of three hours may be required before the degree is granted. Please see the Graduate School Registration and Leave of Absence Policy.

Retroactive Graduate Credit

Degree Programs

Graduate students fully admitted into a degree program at the University of Arkansas may request that up to 12 hours of courses taken in the final 12-month period of their undergraduate degree count toward their graduate degree, if these courses were taken on the University of Arkansas, Fayetteville campus. These courses may not have been used for the undergraduate degree (unless the student is in a program where this has been approved by the Graduate Council), must be approved by the student's advisory committee, and must be at the 5000 level or above. Petition will be by the student's advisory committee or major professor to the Graduate School.

Sometimes students have completed their undergraduate degrees elsewhere, but have then taken course work as undergraduate students at the University of Arkansas after completing their undergraduate degree, but before being admitted to the Graduate School. Such students may request that up to six hours of courses taken for undergraduate credit in the final 12 months prior to admission to the Graduate School count toward their degrees. All of the rules stated in this policy are also applicable to this type of situation.

If the student's advisory committee wishes to accept courses at the 4000 level toward the graduate degree, when those courses were taken in the last 12 months of a student's undergraduate degree at the University of Arkansas, Fayetteville, the committee may petition the Graduate School. The petition must include an explanation of why the committee considers these courses to meet graduate degree requirements and expectations for graduate-level work. The instructors for these courses must have had graduate faculty status, and these courses may not have been used for the undergraduate degree.

Courses at the 3000 level taken before the student is fully admitted to the Graduate School may not be used to fulfill graduate degree requirements.

Courses offered by institutions other than the University of Arkansas, Fayetteville, may not be counted toward the graduate degree requirements in this way.

Graduate Certificates

Graduate students fully admitted to a graduate certificate program are allowed to use six hours of credit to count for both an undergraduate degree and a graduate certificate. All requirements of this retroactive graduate credit policy will apply and a transcript notation will note that the courses may not be used to fulfill requirements for a graduate degree.

Use of Electronic Resources of the Library

The use of electronic resources of the University Libraries from a location outside of the library is only available to enrolled students. Students who are enrolled in the spring semester and have pre-registered for the succeeding fall semester may have access to these resources during the intervening summer. Students who are not required to be enrolled for other reasons, who are not pre-registered for the fall, and who wish to use the library resources during the summer must be enrolled in at least one hour of credit in any one of the summer sessions or be entered in the student affiliates table on UACConnect. Requests for affiliate status for graduate students must be sent from the major professor to the Graduate School.

The Research Council

The Research Council recommends policies to encourage research, establish a research environment, and provide research support facilities; serves as a review board for proposed research programs and facilities; recommends adjudication of variances to policies and procedures; supervises the approved policies; and addresses research misconduct cases at the direction of the Provost/Vice Chancellor for Academic Affairs. Membership consists of a faculty member active in research from: a) the Dale Bumpers College of Agricultural, Food and Life Sciences; b) the Sam M. Walton College of Business; c) the College of Education and Health Professions; d) the College of Engineering; and e) one from the science areas of the Fulbright College of Arts and Sciences and f) one from another research area in the Fulbright College; g) non-voting, one student; h) ex officio and non-voting, the Director of Research and Sponsored Programs; and i) ex officio and non-voting, the Vice Provost for Research. A secretary (non-voting) will be provided by the Office of Research and Sponsored Programs.

Policies/Procedures for Use of Toxic Substances on Campus

The University of Arkansas is committed to the health and safety of its students, faculty, and staff. It is recognized that during their work for the university, some people will be involved in activities that require the use of substances or materials that are hazardous or toxic in nature. The Environmental Health and Safety unit of the physical plant has prepared the UAF Chemical Hygiene plan. This document addresses the safe use of toxic substances in laboratories. In addition, it defines the minimum acceptable standard safety practices for execution of laboratory work for both research and teaching. The chemical hygiene plan is available from the Office of Environmental Health and Safety (<http://ehs.uark.edu/>) and is the full statement of the UAF campus policy and procedures for handling toxic substances.

Travel Policy for Graduate Students

Graduate students who travel on university business must comply with the travel policies of the university. For those graduate students not on assistantships/fellowships, please see the university policy 332.4 (<https://vcfa.uark.edu/policies/fayetteville/sade/3324.php>).

Term Paper Assistance

The use of the services of term paper assistance companies is a violation of university policies on academic integrity. Student submission of such research or term papers to meet requirements of any class or degree program is expressly prohibited and constitutes academic dishonesty. Any violation of this prohibition will be dealt with as a violation of the academic integrity policy.

Academic Dismissal/Academic Probation

Students may be dropped from further study in the Graduate School if at any time their performance is considered unsatisfactory as determined by either the program faculty or the Dean of the Graduate School. Academic or research dishonesty and failure to maintain a specified cumulative grade-point average are considered to be unsatisfactory performance. See the Graduate Student Dismissal Policy, the Academic Probation Policy for Graduate Students, the university's Academic Integrity Policy, and the Research and Scholarly Misconduct Policies and Procedures in this catalog.

Using its own written procedures, the graduate faculty of an academic degree program may recommend that the student be readmitted to the

Graduate School after dismissal. Dismissed students with non-degree status may petition for readmission to the Graduate School by submitting a written appeal to the Dean of the Graduate School. The graduate faculty of any degree program may establish and state in writing requirements for continuation in that program.

Graduate Student Dismissal Policy

Graduate degree programs have the right to dismiss graduate students who do not make adequate academic progress or engage in illegal, fraudulent, unethical, or unprofessional behavior as defined in any of the university codes or policies pertaining to academic and research integrity or contained in departmental/program codes of professional conduct. There may also be other unusual situations in which a student may be dismissed from a degree program. In each case, the dismissal should comply with the following procedures.

Lack of Adequate Academic Progress

Students may be dismissed per the academic probation policy of the Graduate School, and students should familiarize themselves with this policy. In addition, students who have not been placed on probation, but who are not making adequate academic progress, may also be dismissed. They must be warned in writing of the possibility of dismissal and will be given a clear statement about what must be done within a specified time period to alleviate the problem. A copy of this warning letter must be filed with the Graduate School. These expectations must be reasonable and consistent with expectations held for all students in the program. If the student does not meet the requirements within the time frame specified, he/she may be dismissed by the degree program with notification to the student and the Graduate School. Students dismissed in this way will not necessarily be dismissed by the Graduate School. Students may appeal this dismissal to the Graduate School, following the procedures outlined in the Graduate Student Grievance Policy, if the student is able to document a university error in policy or procedure. Students who receive two consecutive unsatisfactory academic progress reports may be immediately dismissed by the degree program and the Graduate School.

Academic or Research Misconduct and Violations of the Code of Student Life/

For the process for dismissing students as a result of academic misconduct, please see the University of Arkansas Academic Integrity Policy; for dismissing students for research misconduct, please see the Research and Scholarly Misconduct Policy and Procedures. For violations of the Code of Student Life, please see the University of Arkansas Student Handbook.

Unethical and Unprofessional Conduct

Departments/programs may dismiss students for unethical or unprofessional conduct in accordance with the policies of their professional or accreditation agencies. Such policies must have been reviewed and approved by the Graduate Council and the Faculty Senate prior to implementation. Students will be made aware of the existence of these policies when they enter the program and the department will retain a signed statement from the students indicating that they are aware of the policies. Such policies must provide processes that include both initial review of the charges and a process for appeal on the grounds of either substance or procedure. Dismissals as a result of departmental/program conduct codes will not be reviewable except when violations of those processes/policies can be demonstrated. If evidence of university error in the application of these policies can be demonstrated, the *Graduate Student Grievance Policy and Processes* may be available to the student. Students dismissed in this way from the department/program will not be

dismissed by the Graduate School unless there is also evidence of a violation of the Code of Student Life.

Other Situations

Departments may dismiss students for situations other than those specified above. When doing so, the department must notify the student in writing of the possibility of dismissal and send a copy of this letter to the Graduate School. If it is possible for the student to rectify the situation, he/she must be given a clear statement about what must be done within a specified time period to alleviate the problem. These expectations must be reasonable and consistent with expectations held for all students in the program. If the student does not meet the requirements within the time frame specified, he/she may be dismissed by the degree program with notification to the student and the Graduate School. Students dismissed in this way will not necessarily be dismissed by the Graduate School.

If the situation cannot be rectified, the student will be notified in writing of the grounds for dismissal and the date when the dismissal will be effective. This will normally be the end of the semester in which the student is enrolled, but the circumstances of the dismissal will be important in determining this date.

If students feel that there has been a violation of university policy in their dismissal, they may appeal to the Graduate School, following the procedures outlined in the Graduate Student Grievance Policy.

Academic Probation Policy for Graduate Students

Whenever a regularly admitted graduate student earns a cumulative grade-point average below 2.85 on graded course work taken in residence for graduate credit, he/she will be warned of the possibility of academic dismissal. When a graduate student has accumulated a minimum of 15 hours of graded course work taken in residence for graduate credit with a cumulative grade-point average below 2.85, and has received at least one warning, he/she will be academically dismissed from the Graduate School. The student's degree program may request that the academic warning period be extended if the program can offer extenuating circumstances as a rationale and is willing to provide a plan of remediation for the student's success.

Graduate teaching and research assistants and students on Lever, Doctoral, Chancellor, Walton or other fellowships must maintain a cumulative grade-point average of at least 2.85 on all course work taken for graduate credit. If a student's cumulative GPA falls below 2.85 on 6 or more hours of graduate work (one full-time semester), notification will be sent to the student and his/her department. If the CGPA is below 2.85 at the end of the next major semester (fall or spring), the department will not be allowed to appoint the student to an assistantship/fellowship until such time as his/her CGPA has been raised to the required level. Note: Individual degree programs may have more stringent requirements.

The Graduate School calculates the cumulative grade-point average on all courses taken for graduate credit at the University of Arkansas. Individual degree programs have the option to calculate the cumulative grade-point average only for those graduate courses taken in residence for the current degree. Consequently, individual degree programs may academically dismiss students whose cumulative grade point average on all graduate course work is above 2.85, but whose work for the current degree is below 2.85. If a program adopts this alternative policy, it must be so stated in the departmental graduate student handbook and in the Graduate Catalog and must apply to all graduate students in that program. When the program anticipates dismissing a student whose cumulative grade-

point average is above 2.85, the program must notify the student, using the same process as specified in the general probation policy and must also notify the Graduate School. This policy is effective Fall 2003.

Annual Notice of Student Rights Under the Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They are as follows:

1. The right to inspect and review the student's education records, with some exceptions under the Act, within 45 days of the day the university receives a request for access. Students should submit to the Office of the Registrar written requests that identify the record(s) they wish to inspect. The university official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the university official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education records that the student believes are inaccurate or misleading. Students should write the university official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. A sample form, which may be used in making this request, is contained in the appendix to UA Systemwide Policies and Procedures 515.1 (<http://www.uasys.edu/policies/ua-system-policies/>).

If the university decides not to amend the record as requested by the student, the university will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing and is also contained in UA Systemwide Policies and Procedures 515.1 (<http://www.uasys.edu/policies/ua-system-policies/>).

3. The right to withhold consent of disclosure of directory information, defined as the following information: the student's name; date of birth; address; telephone number; email address; major field of study; classification by year; number of hours in which enrolled and number completed; participation in officially recognized activities and sports; weight and height of members of athletic teams; dates of attendance including withdrawal dates; degrees, scholarships, honors, and awards received, including type and date granted; and photograph.

This information will be subject to public disclosure unless the student restricts such information through the appropriate settings in UAConnect, the student information system, or informs the Office of the Registrar in writing that he or she does not want this information designated as directory information.

4. The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent.

One exception, which permits disclosure without consent, is disclosure to school officials with legitimate educational interests. A school official is a person employed by the university in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the university has contracted (such

as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an educational record to fulfill his or her professional responsibility. Upon request, the university also discloses education records without consent to officials for another school in which a student seeks or intends to enroll.

Postsecondary institutions may also disclose personally identifiable information from education records, without consent, to appropriate parties, including parents of an eligible student, in connection with a health or safety emergency. Under this provision, colleges and universities may notify parents when there is a health or safety emergency involving their son or daughter, even if the parents do not claim the student as a dependent.

There are several other exceptions to FERPA's prohibition against non-consensual disclosure of personally identifiable information from education records, some of which are briefly mentioned below. Under certain conditions (specified in the FERPA regulations), a school may non-consensually disclose personally identifiable information from education records:

- to authorized representatives of the Comptroller General of the United States, the Attorney General of the United States, the U.S. Secretary of Education, and State and local educational authorities for audit or evaluation of Federal or State supported education programs, or for the enforcement of or compliance with Federal legal requirements that relate to those programs;
 - to the National Student Clearinghouse for enrollment and degree reporting;
 - to organizations conducting studies for or on behalf of the school making the disclosure for the purposes of administering predictive tests, administering student aid programs, or improving instruction;
 - to officials of another school where the student seeks or intends to enroll, or where the student is already enrolled if the disclosure is for purposes related to the student's enrollment or transfer;
 - to comply with a judicial order or a lawfully issued subpoena;
 - to the victim of an alleged perpetrator of a crime of violence or a non-forcible sex offense concerning the final results of a disciplinary hearing with respect to the alleged crime; and
 - to any third party the final results of a disciplinary proceeding related to a crime of violence or non-forcible sex offense if the student who is the alleged perpetrator is found to have violated the school's rules or policies. The disclosure of the final results only includes: the name of the alleged perpetrator, the violation committed, and any sanction imposed against the alleged perpetrator. The disclosure must not include the name of any other student, including a victim or witness, without the written consent of that other student.
5. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA. The name and address of the office that administers FERPA is as follows:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW
Washington DC 20202-4605

6. UA System Policy and Procedure 515.1 (<http://www.uasys.edu/policies/ua-system-policies/>) serves as a supplement to the campus FERPA policy.
7. FERPA applies to students at the University of Arkansas at the point of their enrollment into courses.

Photographic and Video Images

The university is proud to publish and display photographic and video images of U of A students, their activities and accomplishments. Any student who does not wish to be represented in such photographic and video images by the university should choose to withhold photos on the FERPA option on the university's student information system.

Annual Graduate Student Academic Review

It will be a policy of the Graduate Council that every master's, specialist, and doctoral student will be reviewed annually by his/her degree program for progress toward the degree. At a minimum, the review will cover progress in the following: a) completing courses with an adequate grade-point average; b) completing the thesis/dissertation/project requirements; c) completing all of the required examinations; d) completing other requirements for the degree. When the review of each student is completed, the review form will be signed by the graduate student and the department/program head/chair, as well as other appropriate individuals as designated in the program review policy. This review will be forwarded to the Graduate School, to be included in the student's file. If a student receives two consecutive reviews indicating that the student is not making adequate academic progress, the program and the Graduate School have the option to dismiss the student.

Graduate School Registration and Leave of Absence Policy

All doctoral students who have been admitted to candidacy must enroll in a minimum of one hour of course or dissertation credit every semester (fall, spring) until they graduate. Under unusual circumstances, this enrollment requirement may be waived for post-candidacy doctoral students for up to two years, with an approved request for a leave of absence. To request a leave of absence, the student's major professor must petition the Graduate Dean, specifying the circumstances that make it necessary for the student to interrupt his/her studies. While a decision will be made on a case-by-case basis, circumstances that might be considered include serious illness of the student or his/her immediate family, serious personal problems, or job-related issues. While the student is on an approved leave of absence, he/she cannot use any university resources, such as the library or faculty time. A post-candidacy doctoral student who takes an unauthorized break in registration by failing to maintain continuous enrollment or failing to obtain a leave of absence will no longer be considered a graduate student at the University of Arkansas. Students who wish to be reinstated will be required to file an Application for Readmission (no fee) and may be required to register for three graduate credits for each term of unauthorized break in registration. In the case of extraordinarily extenuating circumstances, students may appeal the provisions of this policy and request additional terms of leave of absence or forgiveness of the additional credits of registration. Such an appeal must be made to the Graduate Dean.

The student should be aware that the leave of absence policy does not waive the time requirements for a degree. A separate petition must be made for a time extension, if required. Also, a request for leave

of absence may not be made for the semester in which the student graduates.

Time Extension

It is a requirement of the Graduate School that certificate, master's and specialist students complete their degrees within six consecutive calendar years from the date of the first courses used to fulfill requirements for the degree and doctoral students complete the degree within seven consecutive calendar years from the semester in which the student was first admitted to the program. Requests to extend these time requirements must be reviewed and approved by the Graduate Dean, following these procedures:

1. The student's major adviser will fill out a "Request for Time Extension" form (available on the Web site of the Graduate School) and submit this to the Graduate School.
2. For both master's and doctoral students, the central consideration in determining whether more time can be allowed is whether the student's knowledge of the subject matter is current at the time of graduation. Therefore, as part of the request for time extension, the major adviser will be asked to explain how this will be ensured:
 - For the certificate and master's degree, the student's knowledge of any course work over six years old at the time of graduation must be recertified. Please see "Recertification of Student's Knowledge of Course Content," below.
 - For the doctoral degree, recertification of the student's knowledge of course work is not necessary, but the major adviser must explain how the currency of the student's knowledge of the field will be assessed prior to graduation.
3. Requests for time extension are allowed only for course work taken at the University of Arkansas (Fayetteville). We do not allow time extensions on transfer credit.

Recertification of Student's Knowledge of Course Content: The major adviser must specify how recertification of the student's knowledge of course content will occur. By recertification, we mean that the student's knowledge of the subject matter included in the course is determined to be current at the time of graduation and that the content of that course is still current. There are several ways this may be demonstrated. Examples include: The student is teaching the subject matter in a separate context; the student will be examined by the current instructor of the course to determine his/her currency of knowledge; the student will be examined on the subject matter during his/her final oral defense of the thesis or during the comprehensive exam. It is not acceptable to say only that the content of the course has not changed in the time since the student was enrolled, as the student's knowledge of that content is also critical. Courses taken more than 10 years prior to the conferral of the degree will normally not be eligible for recertification.

Administrative Requirement for Graduation

Application for graduation must be completed through the Student Homepage in UAConnect and fees paid by the appropriate deadline in the semester in which degree requirements will be completed and graduation effected. Instructions for applying to graduate can be found at registrar.uark.edu (<https://registrar.uark.edu>). If a student fails to complete the degree, the student must then renew the application by contacting the Registrar's Office. It will not be possible for a student to be cleared to graduate for a previous semester.

Students should be aware that FERPA restrictions on disclosing personally identifiable information may prevent their names being printed in the commencement program and/or being engraved on the sidewalk. Students can change their privacy settings on their Student Homepage in UAConnect. Questions about this should be directed to the Office of the Registrar.

Degrees Offered

The faculty of the Graduate School, under the authorization of the Board of Trustees, grants the degrees listed below. In addition, the Graduate School offers several non-degree graduate certificates. The graduate faculty, as represented by the Dean of the Graduate School and through the Graduate Council, has primary responsibility for the development, operating policies, administration, and quality of these programs. Operating through the Graduate Dean, the faculty appoints committees that directly supervise the student's program of study and committees that monitor research activities and approve theses and dissertations.

- Doctor of Philosophy
- Doctor of Nursing Practition
- Doctor of Occupational Therapy
- Doctor of Education
- Educational Specialist
- Master of Accountancy
- Master of Athletic Training
- Master of Arts
- Master of Arts in Teaching
- Master of Business Administration
- Master of Design Studies
- Master of Education
- Master of Fine Arts
- Master of Information Systems
- Master of Music
- Master of Public Administration
- Master of Public Service (Clinton School)
- Master of Science
- Master of Science in Biological Engineering
- Master of Science in Biomedical Engineering
- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Computer Engineering
- Master of Science in Computer Science
- Master of Science in Electrical Engineering
- Master of Science in Engineering
- Master of Science in Environmental Engineering
- Master of Science in Industrial Engineering
- Master of Science in Mechanical Engineering
- Master of Science in Nursing
- Master of Science in Operations Management
- Master of Social Work

Graduate Certificates (Non-degree)

As defined by the Arkansas Department of Higher Education, graduate certificate programs consist of 12 to 18 hours of required course work in a focused area of study. The awarding of the certificate will be shown on the student's transcript. Students must meet the admission requirements

of the Graduate School and the certificate program. Students who enter a graduate certificate program may use up to six hours of course work taken previously at the University of Arkansas and may use up to six hours of course work taken at another accredited university to meet certificate requirements, with approval of the program faculty and the Graduate School. The Graduate School does not impose a limit on the number of hours that may be shared between graduate certificate programs, but a limit may be set by the program. Students who enter a graduate certificate program must complete all certificate requirements within six years of admission to the program. For students who have been admitted to both a degree program and a certificate program, courses taken to meet the requirements of one may also be used to meet the requirements of the other, at the discretion of the program and the student's Advisory Committee.

Graduate Certificates are offered in the following areas:

- Advanced Instrumental Performance (p. 226)
- African and African American Studies (p. 335)
- Applied Behavior Analysis (p. 310)
- Arkansas Curriculum/Program Administrator (p. 113)
- Autism Spectrum Disorders (p. 310)
- Building-Level Administration (p. 113)
- Bioenergy and Sustainability Technology (p. 25)
- Business (p. 380)
- Business Law (p. 338)
- Criminal Law (p. 339)
- Cross-Sector Alliances (p. 341)
- District-Level Administration (p. 113)
- Educational Measurement (p. 116)
- Educational Program Evaluation (p. 116)
- Educational Psychology (p. 116)
- Educational Statistics & Research Methods (p. 116)
- Enterprise Systems (p. 392)
- Entrepreneurship (p. 380)
- Geospatial Technologies (p. 148)
- Project Management (p. 348)
- STEM Education for Early Childhood (p. 349)
- Sustainability (p. 350)
- Technical Writing and Public Rhetorics (p. 128)

Master of Arts, Master of Science

General minimum requirements of the Graduate School follow for the degrees of Master of Arts, Master of Science – including the several engineering degrees – and Master of Fine Arts. Program requirements may be higher. Note: For degree requirements in the Master of Arts in Economics, see the Graduate School of Business.

1. 24 graduate semester hours and a thesis, or 30 semester hours without a thesis. (The thesis may be a departmental requirement or may be required by the major adviser.)
2. A comprehensive examination.
3. A minimum cumulative grade-point average of 2.85. (Individual departments may have higher grade standards.)
4. Minimum residence of 24 weeks. (See Residence Requirements.)

Program of Study. At the time of admission to the Graduate School and acceptance in a program of study leading to a graduate degree, the

student is assigned to a major adviser. The choice of a major adviser is largely determined by the student's choice of a major subject.

The program of study may consist of courses chosen from one department or it may include such cognate courses from other departments as may in individual instances seem to offer greatest immediate and permanent value. As a general principle, two-thirds of the courses come from the degree program in which the student is seeking a graduate degree. The program of study must be approved by the student's Advisory Committee or, depending on program requirements, the Thesis Committee. No more than six hours of special problems (individual study) courses may count toward a 30 hour master's degree.

A student who writes a master's thesis must register for a minimum of six semester hours of master's thesis. No more than six semester hours of master's thesis enrollment may be given credit in the degree program.

Students wishing to take 3000-level undergraduate courses for graduate credit will find the necessary forms on the Graduate School website (<http://grad.uark.edu/>). Courses numbered at the 3000 level may be taken by graduate students for graduate credit only when the courses are not in the student's major area of study and when the courses have been approved by the Dean of the Graduate School for graduate credit. The instructor for the course must hold graduate faculty status and must certify that he/she will make appropriate adjustments in assignments and grading scales to raise the level of expectation for the student to the graduate level. No more than 20 percent of the graded course work in the degree program may be comprised of 3000-level courses carrying graduate credit. Undergraduate courses numbered below 3000 will not be allowed to carry graduate credit.

Students wishing to take 4000-level undergraduate courses for graduate credit will find the necessary forms on the Graduate School website (<http://grad.uark.edu/>). The instructor for the course must hold graduate faculty status and must certify that he/she will make appropriate adjustments in assignments and grading scales to raise the level of expectation for the student to the graduate level.

Under ordinary circumstances graduate registration is limited to 18 hours for any one semester including undergraduate courses and courses audited. Registration above 15 hours must be approved by the Graduate Dean.

All requirements for a master's degree must be satisfied within six consecutive calendar years from the first semester of enrollment in the program.

Transfer of Credit. The University of Arkansas will permit a student to transfer six hours of graduate credit from an accredited graduate school in the United States as part of the master's program, provided that the grades are "B" or better, the courses were taken within six years previous to the conferral of the current degree, and the subjects are acceptable to the program concerned. (The transfer of graduate credit from institutions outside the United States is at the discretion of the Graduate Dean.) This does not, however, reduce the minimum requirement of 24 weeks of residence for the master's degree as set by state law. Students contemplating transfer of credit should consult with the Graduate School Office in advance. Please see transfer of credit regulations, below.

Transfer of Credit Regulations Established by the Graduate School for the Various Master's Degrees:

Transfer of Credit is permissible for master's programs only. Transfer of credit is not acceptable for doctoral degrees. For doctoral candidates, at the discretion of the advisory committee, the program of study may be adjusted in lieu of work taken at other colleges or universities and recognized by the candidate's committee, but it will not appear on the University of Arkansas academic record.

Criteria for Acceptable Transfer Credit:

1. The course must have been regularly offered by a regionally accredited graduate school.
2. The course must have been a bona fide graduate level course, approved for graduate credit and taught by a member of the graduate faculty.
3. The student desiring to transfer graduate credit must have been enrolled as a graduate student in the graduate school at the institution offering the course.
4. The course must appear on an official transcript as graduate credit from the institution offering the course.
5. The course grade must be a "B" or "A." (The student's grade-point average is NOT to include grades on transfer courses.)
6. The course must be recommended by the student's major adviser and be applicable to the degree requirement at the University of Arkansas.
7. The course must not have been taken as a self-paced online (correspondence) course or for extension credit.
8. The course must be acceptable to the department concerned and to the Graduate Dean.
9. The student must have satisfied the 24-week residence requirements. (The student must have satisfactorily completed a total of 24 hours of graded graduate course work taken in residence.)
10. The course must have been taken within the time limit of the student's program at the University of Arkansas.
11. Credit from foreign universities is typically not acceptable for transfer because of academic and procedural differences between U.S. regionally accredited and foreign institutions, but petition may be made to the Graduate Dean on a case by case basis.

Note: Graduate credit cannot be transferred to satisfy any of the requirements for the M.B.A. degree unless the school at which the course was taken is accredited by A.A.C.S.B. This requirement is not specified by the Graduate School, but by the Graduate School of Business.

Ex Officio Committee Members: Student committees may contain ex officio members who have graduate faculty status on the University of Arkansas campus. However, when a person does not hold graduate faculty status on the University of Arkansas campus, he/she may still be allowed to hold an ex officio position on a student's committee, in accordance with the following policy: When a committee member does not hold graduate faculty status at the University of Arkansas, he/she will be allowed to serve on a student's master's thesis or doctoral dissertation committee, in addition to the minimum number of members required by the Graduate School or the department/program. The ex officio member will be allowed to sign the thesis or dissertation and his/her vote will be recorded but will not be binding for conferring the degree. This use of the term ex officio will indicate that the person does not hold graduate faculty status at the University of Arkansas and is serving in an honorary role.

Conflict of Interest Policies for Graduate Committees: Students should be aware that the Graduate School has policies pertaining to the composition of advisory and thesis committees. These may be found in the Graduate Student Handbook on the Graduate School website.

Residence Requirements. The candidate must present a minimum of 24 weeks of course hours taken in residence at the University of Arkansas, Fayetteville. A total of 12 hours of residence may be accredited from University of Arkansas off-campus graduate courses (restriction does not apply to graduate degree programs offered through the Graduate Residence Centers, see page 21) or for work done in off-campus classes held in Fayetteville. Acceptance of transferred credit does not reduce the minimum residence requirement of 24 weeks of course hours taken on the University of Arkansas, Fayetteville, campus or through approved University of Arkansas, Fayetteville, distance courses.

Thesis. The title of the thesis must be recommended by the thesis director and the thesis committee and be approved by the Dean of the Graduate School at least three months before the date of the comprehensive examination. The thesis must be submitted for approval to the thesis committee consisting of a minimum of three faculty members who have been approved by the Dean of the Graduate School. This committee must receive the thesis in time for the student to defend the thesis and submit it to the Graduate School by the posted deadline date. In the situation when there is a split decision among committee members of a master's program advisory or thesis committee, majority rules. For instructions on submitting an approved thesis, students should consult the Graduate School's Guide to Preparing Theses and Dissertations. Students will be required to submit their theses to University Microfilms Incorporated (UMI/ProQuest). There will be an additional charge for this submission.

Comprehensive Examination/Thesis Defense. In addition to completing other requirements, the candidate for a master's degree must take a comprehensive examination, which may be oral and/or written as recommended by the major department. If the student has completed a thesis, the final defense of the thesis must be oral. This can substitute for the comprehensive examination, if the department so chooses. If the final defense of the thesis substitutes for the comprehensive examination, the examination may include other aspects of the candidate's graduate work. All members of the thesis committee (and advisory committee, if the thesis defense substitutes for the comprehensive examination) must participate in the thesis defense unless the Dean of the Graduate School has approved an exception. If a committee member does not participate in the final oral defense, that person will be asked by the Graduate School to resign from the committee. While this examination is typically not open to the public (unlike the doctoral dissertation defense), the student's committee chair may, with the approval of the student, open the defense to selected members of the public. Questions from the public are at the discretion of the committee chair. The chair will insure that questions from the public are appropriate by disallowing those which are not.

Students may elect to participate by distance through electronic means in their final oral defense of the thesis, if approved by the thesis faculty director. In advance of the final oral defense, the student must provide to the Graduate School a written, signed statement that he/she has elected this option.

Grade-Point Average. To receive a master's degree, a candidate must present a minimum cumulative grade-point average of 2.85 on all graduate courses required for the degree, unless the department requires a higher grade point average. Failing to earn such an average on the minimum number of hours, the student is permitted to present up to six

additional hours of graduate credit to accumulate a grade-point average of 2.85. In the computation of grade point, all courses pursued at this institution for graduate credit (including any repeated courses) shall be considered. Students who repeat a course in an endeavor to raise their grade must count the repetition toward the maximum of six additional hours. Students should also be aware that they may not use for degree credit any course in which they received a grade of D or F. Individual departments may have higher grade standards.

Split Decisions among Advisory and Thesis Committees. When a split decision occurs among committee members of a master's advisory or thesis committee, the majority decision will hold.

Sharing Courses Between Two Degrees. When a student earns two master's degrees, no more than six hours of course work may be used to satisfy the requirements of both degrees, i.e. shared between the degrees. This rule pertains whether the course work is taken on the University of Arkansas campus or is transferred from another university.

Master of Accountancy

See the accounting program in the Graduate School of Business (p. 352).

Master of Arts in Teaching

See the Elementary Education (p. 124) program or the Teacher Education (p. 321) program.

Master of Business Administration

See the Graduate School of Business (p. 352).

Master of Design Studies

See the Master of Design Studies (p. 107) program.

Master of Education

See the Curriculum and Instruction (p. 98) program.

Master of Fine Arts in Art

See the Art program (p. 33).

Master of Fine Arts in Creative Writing

See the Creative Writing program (p. 95).

Master of Fine Arts in Theatre

See the Theatre program (p. 324).

Other Requirements for M.F.A. Degrees

The policies and procedures approved for the Master of Arts and the Master of Science degrees also apply to the Master of Fine Arts degrees. In addition to completing other requirements, the candidate must pass a comprehensive examination administered by the respective program area.

Master of Information Systems

See the Graduate School of Business (p. 352).

Master of Public Service

See the Clinton School of Public Service (p. 69).

Master of Science in Computer Science

See the Computer Science program (p. 84).

Master of Science in Nursing

See the Nursing program (p. 238).

Master of Social Work

See the Social Work program (p. 299).

Education Specialist Degree

The Educational Specialist degree (Ed.S.) has two areas of specialization – curriculum and instruction, and educational leadership – and may be issued by the Graduate School to those students whose major objective is to develop educational competency in one of these specialized areas. All graduate courses applicable to this degree must be taken on the Fayetteville campus unless otherwise specified.

All requirements for the Educational Specialist degree with specialization in educational leadership may be completed at the Graduate Resident Centers in the University of Arkansas at Pine Bluff, University of Arkansas Community College at Hope, and Phillips Community College of the University of Arkansas at Helena.

Admission to the Program. Admission to the Educational Specialist degree program is based on the total profile of the applicants' educational background and their career objectives. After students have been admitted to the Graduate School, they may seek acceptance in one of the program areas of specialization. All students seeking admission must meet the following admission criteria:

1. Completed a master's degree or its equivalent in a related field.
2. Presented a Graduate Record Examinations general score on three parts (verbal, quantitative, and analytical) or a Miller Analogies Test score. These scores are considered as part of the applicant's profile. Required scores may vary within given programs.
3. Attained a cumulative grade-point average of at least 3.25 on all graduate course work before being admitted into the Specialist program.
4. Students with a 3.00 to 3.25 cumulative grade-point average in all graduate courses must present a combined minimum Graduate Record Examinations general score of 1300 on three parts (verbal, quantitative, and analytical) or 55 on the Miller Analogies Test.
5. Two years of successful professional experience, or equivalent, in an area related to the student's academic goals prior to the completion of the degree.
6. A minimum of three letters of recommendation from individuals capable of commenting on qualification for graduate study.
7. A personal interview with the program area graduate faculty. This evaluative process will subjectively measure factors such as poise, professional objectives, professional commitment, and ability to discuss professional problems.

General Requirements. All Ed.S. programs contain a minimum of 30 semester hours of graduate work beyond the master's degree in a planned program. The program for each student must include the requirements specified in the particular program to which the student has been accepted; assessed deficiencies in the area of specialization; assessed courses to meet current professional requirements of the Master of Education degree; a minimum of nine semester hours of graduate work in a related field(s) other than the area of specialization; a graduate course in research, statistics, or data processing applicable for educational specialists; and an original project, research paper, or report for which variable credit up to six semester hours is required. A grade-

point average of 3.25 is required for the Ed.S. degree program on all work presented as part of the Ed.S. degree program.

After a student is accepted into an Ed.S. program, a committee with a minimum of three members will be appointed, and a program of study will be established outlining the minimum requirements. Only the adviser and one other member of the student's committee may be from the program area sponsoring the program. The committee's responsibilities include the determination of deficiencies, the acceptability of previous graduate work, the approval of the candidate's program of study, the approval of the original project or research paper, and the conduct of a final examination. This examination will be a comprehensive oral evaluation scheduled near the end of the candidate's program and will include one or both of the following: 1) evaluation of the original project, research paper, or report, and 2) evaluation covering material related to the background and professional preparation of the candidate. A written examination may not be taken to substitute for the oral examination. A written account of the original project, research paper, or report will be filed with the program area sponsoring the candidate's program of study.

The last 30 hours of the program must be completed within a period of six years from the first semester of admission to the program. A minimum of 30 weeks of resident study at the University of Arkansas, Fayetteville, in an approved program is required. Credit earned in any University of Arkansas center, off-campus workshop or special course will not count as residence study in the Ed.S. program. The only exception is course work completed at the University of Arkansas at Pine Bluff Graduate Resident Center by students pursuing the Ed.S. degree in education with a specialization in educational leadership; the University of Arkansas Community College at Hope Graduate Resident Center and Phillips Community College of the University of Arkansas at Helena Graduate Resident Center by students pursuing the Ed.S. degree in education with a specialization in educational leadership.

Upon completion of all requirements, candidates are issued an Educational Specialist degree. Their names appear on the commencement program, but there is no distinctive academic regalia in connection with the Educational Specialist degree.

Doctor of Occupational Therapy (O.T.D.)

See the Clinical Occupational Therapy (p. 245) program.

Doctors of Philosophy (Ph.D.) and Education (Ed.D.)

Programs of advanced study leading to the degree of Doctor of Philosophy (Ph.D.) are offered in: animal science, anthropology, biology, business administration, cell and molecular biology, chemistry, community health promotion, comparative literature and cultural studies, computer science, counselor education, crop, soil, and environmental sciences, curriculum & instruction, economics, engineering, education policy, educational statistics and research methods, English, entomology, environmental dynamics, food science, geosciences, history, kinesiology, mathematics, microelectronics-photonics, philosophy, physics, plant science, poultry science, psychology, public policy, rehabilitation, and space and planetary sciences. (Note: For the Ph.D. in Business Administration and Economics, see the Graduate School of Business.)

Programs of advanced study leading to the degree of Doctor of Education (Ed.D.) are offered in adult and lifelong learning, educational leadership, higher education, recreation and sport management, and human resource and workforce development education.

The degrees of Doctor of Philosophy and Doctor of Education are awarded in recognition of high scholarly attainment as evidenced by a period of successful advanced study with at least a 3.0 cumulative graduate grade-point average (2.85 for those students admitted to the Graduate School prior to Fall 2001), the satisfactory completion of certain prescribed examinations, and the development of a dissertation covering some significant aspect of a major field of learning.

Students who wish to become candidates for the degree of Doctor of Philosophy or Doctor of Education are expected to complete work equivalent to the requirements for the master's degree as determined by program faculty and must apply to be admitted to the Graduate School and the specific program of study. A student cannot satisfy any part of the residence requirement for the doctoral degree until after he/she has been officially admitted to the doctoral degree program.

Immediately after admission to the program, with the approval of the Dean of the Graduate School, a Doctoral Program Advisory Committee will be appointed from the graduate faculty to evaluate the student's preparation and fitness for further graduate work. This committee will serve in an advisory capacity in working out and directing a suitable program of advanced study and investigation. The student's major adviser shall serve as chair of the committee. Appointment of this committee does not constitute admission to candidacy for the degree of Doctor of Philosophy or Doctor of Education, a very important and significant step in the student's graduate career, which must be taken after the student has completed approximately two years of graduate work beyond the baccalaureate degree.

The degree must be completed within seven consecutive calendar years from the first semester of admission to the program.

Program of Study. The objectives of the program of study leading to the degree of Doctor of Philosophy or Doctor of Education shall be scholarly achievement of high order and the development of a fundamental understanding of the major field and its relation to supporting fields of knowledge, rather than the satisfactory completion of a certain number of credit hours. The nature of the program of study will vary somewhat, depending upon the major field of study and the objective of the prospective candidate.

Ex Officio Committee Members: Student committees may contain ex officio members who have graduate faculty status on the University of Arkansas campus. However, when a person does not hold graduate faculty status on the University of Arkansas campus, he/she may still be allowed to hold an ex officio position on a student's committee, in accordance with the following policy:

When a committee member does not hold graduate faculty status at the University of Arkansas, he/she will be allowed to serve on a student's master's thesis or doctoral dissertation committee, in addition to the minimum number of members required by the Graduate School or the department/program. The ex officio member will be allowed to sign the thesis or dissertation and his/her vote will be recorded but will not be binding for conferring the degree. This use of the term ex officio will indicate that the person does not hold graduate faculty status at the University of Arkansas and is serving in an honorary role.

Conflict of Interest Policies for Graduate Committees: Students should be aware that the Graduate School has policies pertaining to the composition of advisory and dissertation committees. These may be found in the Graduate Student Handbook on the Graduate School website.

Transfer of Credit. Transfer of credit is not acceptable for doctoral degrees. For doctoral candidates, at the discretion of the advisory committee, the program of study may be adjusted in lieu of work taken at other colleges or universities and recognized by the candidate's committee, but it will not appear on the University of Arkansas academic record.

Grade-Point Average Requirement. A minimum cumulative graduate grade-point average of 3.0 is required to earn a Doctor of Philosophy or Doctor of Education degree. Note: For students admitted to the Graduate School prior to Fall 2001, the minimum cumulative graduate grade-point average required to earn a Doctor of Philosophy or Doctor of Education degree was 2.85. Students should also be aware that they may not present for degree credit any course in which they earned a grade of D or F.

Language Requirement. Foreign language requirements for the Doctor of Philosophy degree vary from department to department. For specific details see departmental statements. These requirements should be completed early in the doctoral program. The Doctor of Education degree does not have a foreign language requirement.

Examination for Candidacy. After completing approximately two years of graduate study, the prospective candidate must take candidacy examinations in specified fields of study in accordance with the requirements of the program/department in which the candidate is working. These examinations may be either written or written and oral, but the expectation is that their purpose is to determine if a student is prepared to move to the independent research stage of his/her degree. Upon satisfactorily completing these examinations, the student may be admitted to candidacy and may proceed to work toward completion of the remaining requirements for the degree. The Graduate School should be notified within two weeks of the student being admitted to candidacy. Note: The Graduate School considers the Advisory Committee to be responsible for administering and evaluating the candidacy examinations, but degree programs may have different structures.

Registration. All doctoral students who have been admitted to candidacy must enroll in a minimum of one hour of graduate course work or dissertation credit every semester (fall, spring, summer) until they graduate. Under unusual circumstances, this enrollment requirement may be waived for post-candidacy doctoral students for up to two years, with an approved request for a leave of absence. See the Graduate School Registration and Leave of Absence Policy.

Dissertation. Each candidate must complete a doctoral dissertation on some topic in the major field. The topic assignment shall be made and a title filed with the Dean of the Graduate School at least one year before the final examination, the specific problem and subject of the dissertation to be determined by the major adviser, the candidate, and the advisory committee. The completed dissertation must be a definite, scholarly contribution to the major field. This contribution may be in the form of new knowledge of fundamental importance, or of modification, amplification, and interpretation of existing significant knowledge.

Each doctoral candidate must register for a minimum of 18 hours of doctoral dissertation. After the student has passed the candidacy examinations, the student must register for at least one hour of dissertation (or graded course work) each semester and one hour during the summer session until the work is completed, whether the student is in residence or away from the campus. Before the final degree is conferred, registration will be assessed for each semester in which a student fails to register without prior approval of the Dean of the Graduate School.

The dissertation must be submitted for approval to the dissertation committee consisting of a minimum of three faculty members who have been approved by the Dean of the Graduate School. This committee must receive the dissertation in time for the student to defend the dissertation and submit it to the Graduate School by the posted deadline date. For instructions on submitting an approved dissertation, students should consult the Graduate School's Guide to Preparing Theses and Dissertations. Students will be required to submit their dissertations to University Microfilms Incorporated (UMI/ProQuest).

Final Examination. The candidate's final examination for the degree of Doctor of Philosophy or Doctor of Education will be oral. At least two weeks in advance, the major adviser will forward to the Dean of the Graduate School notification about the date, time and place of the final oral examination. The examination will be primarily concerned with the field of the dissertation, but may also include other aspects of the candidate's graduate work. The doctoral dissertation committee is responsible for insuring that the dissertation contributes new knowledge of fundamental importance or significantly modifies, amplifies, or interprets existing knowledge in a new and important manner. All members of the dissertation committee must participate in the final oral defense of the dissertation unless the Dean of the Graduate School has approved an exception. This participation may be by distance. If they do not participate in the final oral defense, in person or by distance, they will be asked by the Graduate School to resign from the committee. While this examination is open to the public, the exam is controlled by the student's committee chair. Questions from the public are at the discretion of the committee chair. If the committee chair expects to allow questions from the public, the student must be so advised. The chair will insure that questions from the public are appropriate by disallowing those which are not.

Students may elect to participate by distance through electronic means in their final oral defense of the dissertation, if approved by the dissertation faculty director. In advance of the final oral defense, the student must provide to the Graduate School a written, signed statement that he/she has elected this option.

Split Decisions Within Advisory and Dissertation Committees. In the situation when there is a split decision among committee members of a doctoral program advisory or dissertation committee, the situation must be resolved to the satisfaction of each committee member. In the event that each committee member is not satisfied, the committee member may insist on the necessary steps to reach a resolution or elect to step down from the committee. In unusual circumstances, the Dean of the Graduate School may remove a faculty member from a student's thesis/dissertation or advisory committee, or make an alternative arrangement (e.g., assign a representative from the Graduate faculty to serve on the committee).

Academic Integrity

As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the university's Academic Integrity Policy (<http://honesty.uark.edu/policy/>) at honesty.uark.edu (<http://honesty.uark.edu/>). Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

Grades and Marks

Final grades for courses are "A," "B," "C," "D," and "F" (except for courses taken in the Fay Jones School of Architecture and Design, which both use a plus/minus system). No credit is earned for courses in which a grade of 'D' or "F" is recorded.

A final grade of "F" shall be assigned to a student who is failing on the basis of work completed but who has not completed all requirements. The instructor may change an "F" so assigned to a passing grade if warranted by satisfactory completion of all requirements.

A mark of "I" may be assigned when a legitimate circumstance has prevented the student from completing all course requirements and the work completed at the time of assigning the "I" is of passing quality. It is the discretion of the instructor that determines what qualifies as a legitimate circumstance. It is recommended that the instructor, prior to the assignment of an "I" mark, document the legitimate circumstance and conditions for completing course requirements. An "I" so assigned may be changed to a grade provided all course requirements have been completed within 12 months after the end of the term in which the "I" was assigned. If the instructor does not report the grade within the 12-month period, the "I" shall be changed to an "F." When a mark of "I" is changed to a final grade, the grade points and academic standing are appropriately adjusted on the student's official academic records.

A mark of "AU" (Audit) is given to a student who officially registers in a course for audit purposes (see Registration for Audit).

A mark of "CR" (credit) is given for a course in which the university allows credit toward a degree, but for which no grade points are earned. The mark "CR" is not normally awarded for graduate-level courses but may be granted for independent academic activities. For a master's degree, a maximum of six semester hours of "CR" may be accepted toward the requirements for the degree.

A mixing of course letter grades and the mark "CR" is permitted only in graduate-level courses in which instruction is of an independent nature.

A mark of "R" (Registered) indicates that the student registered for master's thesis or doctoral dissertation. The mark "R" gives neither credit nor grade points toward a graduate degree.

A mark of "S" (Satisfactory) is assigned in courses such as special problems and research when a final grade is inappropriate. The mark "S" is not assigned to courses or work for which credit is given (and thus no grade points are earned for such work). If credit is awarded upon the completion of such work, a grade or mark may be assigned at that time and, if a grade is assigned, grade points will be earned. Courses with marks of S may not be used to count toward graduate degree requirements.

A mark of "W" (Withdrawal) will be given for courses from which students withdraw after the first 10 class days of the semester and before the drop deadline of the semester.

For numerical evaluation of grades, "A" is assigned 4 points for each semester hour of that grade; "B," 3 points; "C," 2 points; "D," 1 point; and "F," 0 points. Grades of plus and minus are assigned grade-point values in the Fay Jones School of Architecture and Design.

Students awarded a graduate degree must complete the minimum specified hours by the degree program and the Graduate School. Courses

not marked in the course description as eligible to be repeated for degree credit may be included in this total only once.

Grade Appeal Process for Graduate Students

The Graduate School of the University of Arkansas recognizes that there may be occasions when a graduate student questions the fairness or accuracy of a grade. Situations that may result in an appeal include those where an instructor's policy was not applied consistently to all students, the instructor's actions differed substantially from announced policy or the syllabus, or that a policy was not announced. All grievances concerning course grades must be filed within one calendar year after the end of the term in which the grade is assigned. In such cases, the following process shall apply.

The student should first discuss the matter with the instructor involved, doing so as soon as possible after receiving the grade. If the student chooses to pursue an appeal, the student shall take the appeal in written form to the appropriate department or program chairperson of the program in which the course was instructed. The appeal should present the basis of the appeal with evidence the student may have to support the appeal. If that person determines the case has no merit, that person will inform the student and the instructor within five working days of having received the appeal from the student, or as soon thereafter as is practicable. If that person believes the complaint may have merit, that person will discuss it with the instructor. The instructor will have five working days from the date of that discussion (or as soon thereafter as is practicable) to decide whether to change the grade. In the case that the department or unit chairperson is the instructor, the student should submit an appeal in written form to the appropriate dean of the college in which the course was instructed.

If the matter remains unresolved, the department/program chair/head/director will, within 15 working days after receiving the original written approval (or as soon thereafter as is practicable), refer it to an *ad hoc* committee composed of programmatic or departmental faculty. This committee will be appointed by the department or program chairperson and will have at least three faculty with graduate faculty status representing the program or department in which the course was instructed. In the case where there are fewer than three faculty within the program or department to serve on the committee, graduate faculty members from a closely related discipline will be appointed to serve. In the case where the department or unit chairperson is the instructor of the appeal, the *ad hoc* committee will be appointed by the appropriate dean of the college in which the course was instructed. The instructor whose grade is being challenged shall not serve on this *ad hoc* committee. The department/program chair/head/director or dean will appoint one of the committee members to serve as chair of the committee. The chair will be responsible for convening the committee, ensuring that this policy is followed and that there have been attempts to find a fair and equitable solution to the appeal.

The committee will examine available written information on the dispute, will be available to meet with the student and with the instructor, and will meet with others as it sees fit. The student and faculty member will not be asked to meet with the committee together unless both sides agree to do so. The committee will have a maximum of 20 working days (or as soon thereafter as is practicable), from the date that the committee received the appeal, to deliberate and make a recommendation as follows. However, with the agreement of the instructor and the student, this time limit may be suspended while the committee attempts to negotiate a solution.

If by majority vote, the *ad hoc* faculty committee determines, through its inquiries and deliberations, that the grade should not be changed, the

committee shall communicate this conclusion to the student, the faculty member, and the chairperson. This will end the appeal unless the student can demonstrate a violation of University policy in the original assessment of the grade or in the deliberation by the *ad hoc* committee. In such cases, the graduate student will have access to the Graduate Student Grievance policy.

If, by a majority vote, the *ad hoc* faculty committee determines that the grade should be changed, the committee will request that the instructor make the change and provide the instructor with a written explanation. Should the instructor decline, he or she must provide to the *ad hoc* faculty committee a written explanation for refusing to do so within five working days of receiving the request from the committee (or as soon thereafter as is practicable).

If the *ad hoc* faculty committee, after considering the instructor's written explanation, concludes it would be inappropriate to allow the original grade to stand, it may then recommend to the department chairperson, or dean in the case where the department chairperson is the faculty whose grade is being challenged that the grade be changed. That individual (department chair or dean) will provide the instructor with a copy of the recommendation and will ask the instructor to implement it. If the instructor continues to decline, the chairperson or dean is then obligated to change the grade, notifying the instructor and the student of this action. Only the chairperson or dean has the authority to effect a grade change over the objection of the instructor who assigned the original grade, and only after the foregoing procedures have been followed. The final decision on the appeal must be made within 45 days of the student submitting it to the department/program chair/head/director (or as soon thereafter as is practicable). The instructor may appeal the decision to the academic dean or if the instructor is that person, to the Provost.

The final decision of the committee will be communicated to the Graduate School within five working days of its conclusion in the department.

This page includes information and policies about the following:

- Academic Grievance Procedures for Graduate Students
- Grievance Policy and Procedures for Graduate Assistants
- Research and Scholarly Misconduct Policies and Procedures

Academic Grievance Procedures for Graduate Students

The Graduate School of the University of Arkansas recognizes that there may be occasions when a graduate student has a grievance about some aspect of his/her academic involvement. It is an objective of this University that such a graduate student may have prompt and formal resolution of his or her personal academic grievances and that this be accomplished according to orderly procedures. Below are the procedures to be utilized when a graduate student has an academic grievance with a faculty member or administrator. If the student has a grievance against another student or another employee of the University, or if the student has a grievance which is not academic in nature, the appropriate policy may be found by contacting the Office of Equal Opportunity and Compliance or the office of the Graduate Dean. For policies and procedures pertaining to conduct offenses, consult the Code of Student Life.

NOTE: Master's students in the Graduate School of Business should follow the grievance procedures for that School.

Definition of Terms

Academic grievance. An academic grievance means a dispute concerning some aspect of academic involvement arising from an administrative or faculty decision which the graduate student claims is in violation of his or her rights and is the result of a University error. The Graduate School considers any behavior on the part of a faculty member or an administrator, which the student believes to interfere with his/her academic progress, to be subject to a grievance. While an enumeration of the students' rights with regard to their academic involvement is not possible or desirable, we have provided a short list as illustration. However, as in all cases involving individual rights, whether a specific behavior constitutes a violation of these rights can only be decided in context, following a review by a panel of those given the authority to make such a decision.

In general, we consider that the graduate student:

1. has the right to competent instruction;
2. is entitled to have access to the instructor at hours other than class times (office hours);
3. is entitled to know the grading system by which he/she will be judged;
4. has the right to evaluate each course and instructor;
5. has the right to be treated with respect and dignity.

In addition, an academic grievance may include alleged violations of the affirmative action plans of the University as related to academic policies and regulations, as well as disputes over grades, course requirements, graduation/degree program requirements, thesis/dissertation/advisory committee composition, and/or adviser decisions.

Formal academic grievance. An academic grievance is considered formal when the student notifies the Graduate Dean, in writing, that he/she is proceeding with such a grievance. The implications of this declaration are: 1) all correspondence pertaining to any aspect of the grievance will be in writing and will be made available to the Graduate Dean; 2) all documents relevant to the case, including minutes from all relevant meetings, will be part of the complete written record and will be forwarded to the Graduate Dean upon receipt by any party to the grievance; 3) the policy contained herein will be strictly followed; and 4) any member of the academic community who does not follow the grievance policy will be subject to disciplinary actions. Filing a formal academic grievance is a serious matter, and the student is strongly encouraged to seek informal resolution of his/her concerns before taking such a step.

Complete Written Record. The "complete written record" refers to all documents submitted as evidence by any party to the complaint, as subject to applicable privacy considerations.

NOTE: Because the tape recordings of committee meetings may contain sensitive information, including private information pertaining to other students, the tape or a verbatim transcription of the tape will not be part of the complete written record. However, general minutes of the meetings, documenting the action taken by the committees, will be part of the complete written record.

Graduate student. Under this procedure, a graduate student is any person who has been formally admitted into the Graduate School of the University of Arkansas, Fayetteville, and who is/was enrolled as a graduate-level student at the time the alleged grievance occurred.

Working Days. Working days shall refer to Monday through Friday, excluding official University holidays.

Procedures

NOTE: Master's students in the Graduate School of Business should follow the grievance procedures for that School.

1. Individuals should attempt to resolve claimed grievances first with the person(s) involved, within the department, and wherever possible, without resort to formal grievance procedures. The graduate student should first discuss the matter with the faculty member involved, or with the faculty member's chairperson or area coordinator. The student's questions may be answered satisfactorily during this discussion. If the grievance is with the departmental chairperson or area coordinator, the student may choose to contact the academic dean or the Graduate Dean, for a possible informal resolution of the matter.
2. If a graduate student chooses to pursue a formal grievance procedure, the student shall take the appeal in written form to the appropriate departmental chairperson/area coordinator, and forward a copy to the Graduate Dean. In the case of a grievance against a departmental chairperson or an area coordinator who does not report directly to a departmental chairperson, or in the absence of the chairperson/coordinator, the student will go directly to the dean of the college or school in which the alleged violation has occurred, or to the Graduate Dean. In any case, the Graduate Dean must be notified of the grievance. After discussion between the chairperson/coordinator/dean and all parties to the grievance, option 2a, 2b, or 3 may be chosen.
 - a. All parties involved may agree that the grievance can be resolved by a recommendation of the chairperson/coordinator/dean. In this case, the chairperson/coordinator/dean will forward a written recommendation to all parties involved in the grievance within 20 working days after receipt of the written grievance. The chairperson/area coordinator/dean is at liberty to use any appropriate method of investigation, including personal interviews and/or referral to an appropriate departmental committee for recommendation.
 - b. Alternatively, any party to the grievance may request that the departmental chairperson/area coordinator/dean at once refer the request, together with all statements, documents, and information gathered in his or her investigation, to the applicable departmental group (standing committee or all graduate faculty of the department). The reviewing body shall, within ten working days from the time its chairperson received the request for consideration, present to the department chairperson/coordinator/dean its written recommendations concerning resolution of the grievance. Within ten working days after receiving these recommendations, the department chairperson/area coordinator/dean shall provide all parties to the dispute with copies of the reviewing body's recommendation and his or her consequent written decision on the matter.
3. If the grievance is not resolved by the procedure outlined in step 2, or if any party to the grievance chooses not to proceed as suggested in 2, he/she will appeal in writing to the Dean of the Graduate School. When, and only when, the grievance concerns the composition of the student's thesis/dissertation committee or advisory committee, the Graduate Dean will proceed as described in step 5 (following). In all other cases, whenever a grievance comes to the attention of the Dean of the Graduate School, either as a result of a direct appeal or when a grievance has not been resolved satisfactorily at the departmental/academic dean level, the Dean of the Graduate School will consult with the person alleging the grievance. If the Graduate Dean determines that there is evidence of a university error and if that person decides to continue the formal grievance procedure, the Graduate Dean will notify all parties named in the grievance, the departmental chairperson/area coordinator, and the academic dean that a formal grievance has been filed. Within ten working days, the Dean of the Graduate School will: 1) with the consent of the student, appoint a faculty member as the student's advocate, and 2) notify the Academic Appeals Subcommittee of the Graduate Council, which will serve as the hearing committee. The Associate Dean of the Graduate School will serve as the chair of the grievance committee and will vote only in the case of a tie. A voting member of the Graduate Council who is not a member of the Academic Appeals Subcommittee will serve as the non-voting secretary of the committee. The committee shall have access to witnesses and records, may take testimony, and may make a record by taping the hearing. Its charge is to develop all pertinent factual information (with the exception that the student and faculty member/administrator will not be required to be present in any meeting together without first agreeing to do so) and, on the basis of this information, to make a recommendation to the Graduate Dean to either support or reject the appeal. The Graduate Dean will then make a decision based on the committee's recommendation and all documents submitted by the parties involved. The Graduate Dean's decision, the committee's written recommendation and a copy of its complete written record (excluding those in which other students have a privacy interest) shall be forwarded to the person(s) making the appeal within 20 working days from the date the committee was first convened; copies shall be sent simultaneously to other parties involved in the grievance and to the dean of the college in which the alleged violation occurred. A copy shall be retained by the Graduate School in such a way that the student's privacy is protected.
4. When, and only when, the grievance concerns a course grade and the committee's recommendation is that the grade assigned by the instructor should be changed, the following procedure applies. The committee's recommendation that the grade should be changed shall be accompanied by a written explanation of the reasons for that recommendation and by a request that the instructor change the grade. If the instructor declines, he or she shall provide a written explanation for refusing. The committee, after considering the instructor's explanation and upon concluding that it would be unjust to allow the original grade to stand, may then recommend to the department chair that the grade be changed. The department chair will provide the instructor with a copy of the recommendation and ask the instructor to change the grade. If the instructor continues to decline, the department chair may change the grade, notifying the instructor, the Graduate Dean, and the student of the action. Only the department chair, and only on recommendation of the committee, may change a grade over the objection of the instructor who assigned the original grade. No appeal or further review is allowed from this action. All grievances concerning course grades must be filed within one calendar year of receiving that grade.
5. When, and only when, a student brings a grievance concerning the composition of his/her thesis/dissertation or advisory committee, the following procedure will apply. The Dean of the Graduate School shall meet with the graduate student and the faculty member named in the grievance and shall consult the chair of the committee, the departmental chairperson/area coordinator, and the academic dean, for their recommendations. In unusual circumstances, the Dean of the Graduate School may remove a faculty member from a student's thesis/dissertation committee or advisory committee, or make an alternative arrangement (e.g. assign a representative from the Graduate faculty to serve on the committee). With regard to the chair

of the dissertation/thesis committee (not the advisory committee), the Graduate School considers this to be a mutual agreement between the faculty member and the student to work cooperatively on a research project of shared interest. Either the graduate student or the faculty member may dissolve this relationship by notifying the other party, the departmental chairperson, and the Graduate Dean. However, the student and the adviser should be warned that this may require that all data gathered for the dissertation be abandoned and a new research project undertaken, with a new faculty adviser.

6. If a grievance, other than those covered by step 4, is not satisfactorily resolved through step 3 or 5, an appeal in writing and with all relevant material may be submitted for consideration and a joint decision by the Chancellor of the University of Arkansas, Fayetteville, and the Provost/Vice Chancellor for Academic Affairs. This appeal must be filed within 20 working days of receiving the decision of the Graduate Dean. Any appeal at this level shall be on the basis of the complete written record only, and will not involve interviews with any party to the grievance. The Chancellor of the University of Arkansas, Fayetteville, and the Provost/Vice Chancellor for Academic Affairs shall make a decision on the matter within 20 working days from the date of receipt of the appeal. Their decision shall be forwarded in writing to the same persons receiving such decision in step 3. Their decision is final pursuant to the delegated authority of the Board of Trustees.
7. If a grievance cannot be resolved internally within the university, a student may file a complaint with the appropriate authority in their state of residence. Arkansas residents must file complaints in writing with the ICAC Coordinator, Arkansas Department of Higher Education (ADHE), 114 E. Capitol, Little Rock, AR 72201, within 20 days of completing the institution's grievance process. As required by ADHE, the grievant must provide a statement from the institution verifying that the institution's appeal process has been followed. ADHE inquiries are limited to courses/degree programs certified by the Arkansas Higher Education Coordinating Board (AHECB) under Ark. Code § 6-61-103 and so matters related to the criteria for certification. For other states, the Student Complaint Process by State Directory, available on the State Higher Education Executive Officers Association website (<http://www.sheeo.org/node/434/>) provides a list of appropriate state officials and/or entities for each state. Students may also contact the Higher Learning Commission of the North Central Association of Colleges and Schools (<http://www.ncahlc.org/>), which is the university's regional accrediting body, at 230 S. LaSalle St., Suite 7-500, Chicago, IL 60604, or at inquiry@hlcommission.org or 1-800-621-7440. This information is provided pursuant to 34 CFR § 668.43(b).
8. If any party to the grievance violates this policy, he/she will be subject to disciplinary action. When alleging such a violation, the aggrieved individual shall contact the Graduate Dean, in writing, with an explanation of the violation.

Grievance Policy and Procedures for Graduate Assistants

NOTE: Graduate Assistants in the Graduate School of Business should follow the grievance procedures for that School.

Introduction

It is the philosophy of the Graduate School that assistantships are not typical employee positions of the University. This has two implications. First, the sponsor should also serve as a mentor to the student and assist, to the extent possible, in facilitating the student's progress toward his/her degree. Second, any questions concerning performance in or

requirements of assistantships shall be directed to the Graduate School or, for master's students in business, to the Graduate School of Business. Note: the term graduate assistant will be used to refer to those on other types of appointments as well, such as fellowships, clerkships, etc.

The Graduate School has the following authority with regard to graduate assistantships:

1. All requests for new positions, regardless of the source of the funds, must be approved by the Graduate School. When the position is approved, the requesting department or faculty member must complete the form "Request for a New Graduate Assistant Position" and submit it to the Graduate School. All proposed changes in duties for existing graduate assistantships must be approved by the Graduate School prior to their implementation.
2. The duty requirements of the graduate assistantship, including the number of hours required, must be approved by the Graduate School. Fifty percent GAs may not be asked to work more than 20 hours per week (Note: this is not limited to time actually spent in the classroom or lab; the 20 hour requirement also pertains to time required to grade/compute results, develop class/lab materials, etc. Moreover, students cannot be asked to work an average of 20 hours per week, with 30 hours one week and 10 hours the next, for example. The duty hour requirement is no more than 20 hours per week for a 50 percent appointment. See the Graduate Handbook. However, it should also be noted that if the student is engaged in research which will be used in his/her required project, thesis or dissertation, or if the student is traveling to professional meetings, data sources, etc., the student may work more than 20 hours per week.) The duty requirements must complement the degree program of the graduate student and must abide by the philosophy that the first priority of graduate students is to finish their degrees. If a student is assigned to teach, the maximum duty assignment is full responsibility for two three-hour courses per semester.
3. The Graduate School has set the following limits on holding graduate assistantships (not fellowships): Master's students may hold a graduate assistantship for no more than four major semesters; a doctoral student may hold a graduate assistantship for no more than eight major semesters; a student who enters a doctoral program with only a baccalaureate degree may hold a graduate assistantship for no more than ten major semesters. The department/program may petition the Graduate School for extensions to these requirements on a case by case basis.
4. The Graduate School, in consultation with the Graduate Council, has the right to set the enrollment requirements for full-time status for graduate assistants (as well as graduate students in general).
5. The Graduate School sets the minimum stipend for graduate assistantships, but does not have responsibility for setting the actual stipend.

Graduate assistants will be provided with a written statement of the expected duties for their positions, consistent with the duties outlined in the "Request for New Graduate Assistant Position" or any amendments submitted to the Graduate School. A copy of the written statement will be submitted to the Graduate School for inclusion in the student's file.

Graduate assistants may be terminated from their positions at any time, or dismissed for cause (Board Policy No. 500.1). Termination for convenience is effected through the giving of a notice, in writing, of that action at least 60 days in advance of the date the employment is to cease; termination for cause, excluding unsatisfactory work performance, or because of abandonment of the assistantship is effected immediately

upon notice and no advance notice shall be required. The conditions under which a graduate assistant may be terminated for unsatisfactory work performance are described in Board Policy No. 500.1. Termination of a graduate assistantship because of the loss of funds may be effected immediately or with reduced notice. In all cases of termination of the graduate assistantship, a copy of the notice must be sent to the Graduate School.

A graduate assistant has the right to request a review of the termination by the Graduate Dean, following the procedure given below. However, a student should be warned that if the grounds for dismissal are based on any of the following, the only defense to the termination is evidence to show that the charges are not true:

1. The student fails to meet the expectations of the assistantship positions, as outlined in the initial written statement provided to him/her at the beginning of the appointment.
2. The student provides fraudulent documentation for admission to his/her degree program and/or to his/her sponsor in applying for the assistantship position.
3. The student fails to meet certain expectations, which need not be explicitly stated by the sponsor, such as the expectation that:
 - a. the student has the requisite English language skills to adequately perform the duties of the position;
 - b. the student has the appropriate experience and skills to perform the duties of the position; and
 - c. the student maintains the appropriate ethical standards for the position. The Research Misconduct Policy provides one reference source for such ethical standards.
4. The student fails to make good progress toward the degree, as determined by the annual graduate student academic review and defined by program and Graduate School policies.
5. The assistantship position expires.

Definition of Terms

Graduate Assistant. Any graduate student holding a position which requires that the student be admitted to a graduate degree program of the University of Arkansas, regardless of the source of funds, and for whom tuition is paid as a result of that position.

Sponsor. The person responsible for the funding and duty expectations for the graduate assistant.

Formal graduate assistant grievance. Any dispute concerning some aspect of the graduate assistantship, as defined above, which arises from an administrative or faculty decision that the graduate student claims is a violation of his or her rights and is the result of a university error. The formal graduate assistant grievance does not pertain to cases in which there is a dispute between co-workers.

Violation of graduate assistant's rights. An action is considered a violation of the graduate assistants' rights if: a) it violates Graduate School policy with regard to graduate assistantships; b) it threatens the integrity of, or otherwise demeans the graduate student, regardless of any other consideration; c) it illegally discriminates or asks the graduate assistant to discriminate; d) it requires the student to do something which was not communicated as a condition of holding the assistantship (or the underlying expectations outlined above); e) it terminates the student from an assistantship for behaviors which are irrelevant to the holding of the assistantship or were never included as expectations for the assistantship; f) it requires the student to do something which violates University policy, the law, or professional ethics. Note: It is impossible to state all of the

conditions which might constitute a violation of graduate assistants' rights or, conversely, which might defend a respondent against charges of such violations. Such complaints require a process of information gathering and discussion that leads to a final resolution of the matter by those who have been given the authority to do so.

Formal grievance. A grievance concerning graduate assistantships/fellowships is considered formal when the student notifies the Graduate Dean, in writing, that he/she is proceeding with such a grievance. The implications of this declaration are: a) the student will be provided with an advocate; b) all correspondence pertaining to any aspect of the grievance will be in writing and will be made available to the Graduate Dean; c) all documents relevant to the case, including minutes from all relevant meetings, will be part of the complete written record, and will be forwarded to the Graduate Dean upon receipt by any party to the grievance; d) the policy contained herein will be strictly followed; and e) any member of the academic community who does not follow the grievance policy will be subject to disciplinary actions. Filing a formal grievance is a serious matter, and the student is strongly encouraged to seek informal resolution of his/her concerns before taking such a step.

Respondent. The person who is the object of the grievance.

Procedures

NOTE: Grievances are confidential. Information about the grievance, including the fact that such a grievance has been filed, may never be made public to those who are not immediately involved in the resolution of the case, unless the student has authorized this release of information or has instigated a course of action which requires the respondent to respond. An exception to this confidentiality requirement is that the immediate supervisor or departmental chairperson of the respondent will be notified and will receive a copy of the resolution of the case. Since grievances against a respondent also have the potential to harm that person's reputation, students may not disclose information about the grievance, including the fact that they have filed a grievance, to any person not immediately involved in the resolution of the case, until the matter has been finally resolved. This is not intended to preclude the student or respondent from seeking legal advice.

1. (Graduate assistants who are master's students in the Graduate School of Business should contact the Director of that School.) When a graduate student believes that his/her rights have been violated, as the result of action(s) pertaining to a graduate assistantship he/she holds or has held within the past year, the student shall first discuss his/her concerns with the respondent. If the concerns are not resolved to the student's satisfaction, the student may discuss it with the Graduate Dean and/or with the Office of Affirmative Action. If the concerns are satisfactorily resolved by any of the above discussions, the terms of the resolution shall be reduced to writing, if any of the involved parties desires to have such a written statement.
2. If the student's concerns are not resolved by the above discussions and he/she chooses to pursue the matter further, the student shall notify the Graduate Dean in writing of the nature of the complaint. This notification will include all relevant documentation and must occur within one year from the date of the occurrence.
3. Upon receipt of this notification and supporting documentation, the Graduate Dean will meet with the graduate student. If the student agrees, the Dean will notify the respondent of the student's concerns. If the student does not wish for the respondent to be notified, the matter will be dropped. The respondent will be given ten working days from receipt of the Graduate Dean's notification to respond to the concerns.

4. The Graduate Dean will meet again with the student and make an effort to resolve the concerns in a mutually satisfactory manner. If this is not possible, and if the Graduate Dean determines that there is evidence of a university error, the Graduate Dean will refer the case to a committee.
5. Within ten working days from the final meeting between the student and the Graduate Dean, the Graduate Dean will notify the respondent and the Academic Appeals Subcommittee of the Graduate Council, which will serve as the hearing committee. The Associate Dean of the Graduate School will serve as the chair of the grievance committee and will vote only in the case of a tie. A voting member of the Graduate Council who is not on the Academic Appeals Subcommittee will serve as the non-voting secretary of the committee. At this time, the Graduate Dean will also assign an advocate to the student. The advocate must be a member of the graduate faculty. The immediate supervisor of the sponsor will serve as his/her advocate. Note: The student and sponsor advocates will have the responsibility to help the student/sponsor prepare his/her written materials and will attend committee meetings with the student/sponsor. The advocate will not speak on behalf of the student/sponsor and will not take part in committee discussions of the merits of the case.
6. The committee shall have access to witnesses and records, may take testimony, and may make a record by taping the hearing. Its charge is to develop all pertinent factual information (with the exception that the student and respondent will not be required to be present in any meeting together without first agreeing to do so) and, on the basis of this information, to make a recommendation to the Graduate Dean to either support or reject the grievance. The Graduate Dean will then make a decision based on the committee's recommendation and all documents submitted by the parties involved. The Graduate Dean's decision, the committee's written recommendation and a copy of all documents submitted as evidence by any party to the complaint, consistent with all privacy considerations, shall be forwarded to the person(s) alleging the grievance within 20 working days from the date the committee was first convened; copies shall be sent simultaneously to other parties involved in the grievance. A copy shall be retained by the Graduate School in such a way that the student's and respondent's privacy is protected. It should be noted that the Graduate Dean has limited authority to require a sponsor to reappoint a graduate assistant. Consequently, the redress open to the student may be limited.
7. If the grievance is not satisfactorily resolved through step 6, an appeal in writing with all relevant material may be submitted by either the student or the sponsor for consideration by the Provost/Vice Chancellor for Academic Affairs of the University of Arkansas. This appeal must be filed within 20 working days of receiving the decision of the Graduate Dean. Any appeal at this level shall be on the basis of the complete written record only and will not involve interviews with any party to the grievance. The Provost/Vice Chancellor for Academic Affairs shall make a decision on the matter within 20 working days from the date of receipt of the appeal. His/her decision shall be forwarded in writing to the Graduate Dean, the student, and the respondent. This decision is final.
8. If any party to the grievance violates this policy, he/she will be subject either to losing the assistantship position or losing the assistantship. When alleging such a violation, the aggrieved individual shall contact the Graduate Dean, in writing, with an explanation of the violation.

Research and Scholarly Misconduct Policies and Procedures

I. Introduction

A. General Policy

The University of Arkansas is committed to the highest integrity in research and scholarly activity. Actions which fail to meet this standard can undermine the quality of academic scholarship and harm the reputation of the University. This policy is designed to help ensure that all those associated with the University of Arkansas carry out their research and scholarly obligations in a manner that is consistent with the mission and values of the University, and provides a means of addressing instances of suspected research misconduct should they arise.

Principal investigators are responsible for maintaining ethical standards in the projects they direct and reporting any violations to the appropriate University official. Students charged with academic misconduct are subject to separate disciplinary rules governing students, however, such cases may also be reviewed under these policies if applicable under the provisions stated below. The Research Integrity Officer, in consultation with the student's dean shall determine which policy is most appropriate in each case.

A charge of research misconduct is very serious, and will be reviewed carefully and thoroughly. Any allegation of research misconduct will be handled as confidentially and expeditiously as possible. Full attention will be given to the rights and responsibilities of all individuals involved. Charges of research misconduct which are determined not to be made in good faith, as provided for in this policy, may result in administrative action against the charging party.

B. Scope

This statement of policy and procedures is intended to carry out the responsibilities of the University of Arkansas, Fayetteville under the Public Health Service (PHS) Policies on Research Misconduct, 42 CFR Part 93 and the research misconduct policies of other funding agencies, as applicable to particular allegations.

This document applies to allegations of research misconduct (as defined below) involving:

- A person who, at the time of the alleged research misconduct, was employed by, was an agent of, or was affiliated by enrolled student status, contract or agreement with the University of Arkansas, Fayetteville; and
- Is accused of plagiarism, fabrication, or falsification of research records produced in the course of research, research training or activities related to that research or research training. This includes any research formally proposed, performed, reviewed, or reported, or any document or record generated in connection with such research, regardless of whether an application or proposal for funds resulted in a grant, contract, cooperative agreement, or other form of support.

Severance of the respondent's relationship with the University, whether by resignation or termination of employment, completion of or withdrawal from studies, or otherwise, before or after initiation of procedures under this policy, will not preclude or terminate research misconduct procedures.

II. Definitions and Standard of Review

Charge. A written allegation of misconduct that triggers the procedures described in this policy.

Complainant. A person who submits a charge of research misconduct.

Deciding Official (DO). The Provost and Vice Chancellor for Academic Affairs who is the institutional official responsible for making determinations, subject to appeal, on allegations of research misconduct and any institutional administrative actions. The Deciding Official will not be the same individual as the Research Integrity Officer and should have no direct prior involvement in the institution's allegation assessment, inquiry, or investigation. Discussing concerns regarding suspected research misconduct, as provided for in Section IV.A. of this policy, shall not be considered direct prior involvement. If the Deciding Official is unable to serve as DO in a particular matter, the Chancellor may appoint an appropriate official to act as the DO for purposes of that matter.

Good Faith Charge. A charge of research misconduct made by a complainant who believes that research misconduct may have occurred. A charge is not in good faith if it is made with reckless disregard for or willful ignorance of facts that would disprove the charge.

Inquiry. The process under the policy for information gathering and preliminary fact-finding to determine if a charge or apparent instance of research misconduct has substance and therefore warrants an investigation.

Investigation. The process under this policy for the formal examination and evaluation of all relevant facts to determine whether research misconduct has occurred, and, if so, the responsible person and the seriousness of the misconduct.

Investigator. Any person, including but not limited to any person holding an academic or professional staff appointment at the University of Arkansas, who is engaged in the design, conduct, or reporting of research.

ORI. The Office of Research Integrity within the U.S. Department of Health and Human Services.

PHS. The Public Health Service within the U.S. Department of Health and Human Services.

Preponderance of Evidence. Evidence which is of greater weight or more convincing than evidence to the contrary; evidence which shows that something more likely than not is true.

Recklessly. To act recklessly means that a person acts in such a manner that the individual consciously disregards a substantial and unjustifiable risk or grossly deviates from the standard of conduct that a reasonable individual would observe; reckless means more than mere or ordinary negligence.

Research. A systematic investigation designed to develop or contribute to generalizable knowledge. The term includes the search for both basic and applied knowledge and well as training methods by which such knowledge may be obtained.

Research Integrity Officer (RIO) means the Chair of the Research Council who is the institutional official responsible for: (1) assessing allegations of research misconduct to determine if the allegations fall within the definition of research misconduct, are covered by 42 CFR Part 93 or other applicable federal policies, and warrant an inquiry on the basis that the allegation is sufficiently credible and specific so that potential evidence of research misconduct may be identified; (2) overseeing inquiries and investigations; and (3) the other responsibilities described in this policy. If the Research Integrity Officer is unable to serve as RIO in a

particular matter, the DO may appoint an appropriate official to act as the RIO for purposes of that matter.

Research Misconduct. Research misconduct means the fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.

1. Fabrication is making up data or results and recording or reporting them.
2. Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
3. Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Research misconduct does not include disputes regarding honest error or honest differences in interpretations or judgments of data, and is not intended to resolve bona fide scientific disagreement or debate. Research misconduct is also not intended to include "authorship" disputes such as complaints about appropriate ranking of co-authors in publications, presentations, or other work, unless the dispute constitutes plagiarism (as defined above).

Research Record. Any data, document, computer file, computer storage media, or any other written or non-written account or object that reasonably may be expected to provide evidence or information regarding the proposed, conducted, or reported research that constitutes the subject of a charge of research misconduct. A research record includes, but is not limited to, grant or contract applications, whether funded or unfunded; grant or contract progress and other reports; laboratory notebooks; notes; printed or electronic correspondence; memoranda of telephone calls; videos; photographs; X-ray film; slides; biological materials; computer files and printouts; manuscripts and publications; equipment use logs; laboratory procurement records; animal facility records; human and animal subject protocols; consent forms; medical charts; and patient research files.

Respondent. The person against whom a charge of research misconduct is directed, or the person whose actions are the subject of an inquiry or investigation.

Standard of Review.

A finding of research misconduct requires that:

1. There be a significant departure from accepted practices of the relevant research community; and
2. The research misconduct be committed intentionally, knowingly, or recklessly; and
3. The allegation be proven by a preponderance of the evidence.

This standard and related definitions are restated in the charge to the investigation committee located in section V.E. of this policy.

III. Rights and Responsibilities

A. Research Integrity Officer

The Chair of the Research Council will serve as the RIO who will have primary responsibility for implementation of the institution's policies and procedures on research misconduct. These responsibilities include the following duties related to research misconduct proceedings:

- Consult confidentially with persons uncertain about whether to submit an allegation of research misconduct;

- Receive allegations of research misconduct;
- Assess each allegation of research misconduct in accordance with Section V.A. of this policy to determine whether the allegation falls within the definition of research misconduct and warrants an inquiry;
- As necessary, take interim action and notify ORI of special circumstances, in accordance with Section IV.H. of this policy;
- Sequester research data and evidence pertinent to the allegation of research misconduct in accordance with Section V.C. of this policy and maintain it securely in accordance with this policy and applicable law and regulation;
- Provide confidentiality to those involved in the research misconduct proceeding as required by 42 CFR § 93.108 or other applicable law or regulations, or institutional policy;
- Notify the respondent and provide opportunities for him/her to review/comment/respond to allegations, evidence, and committee reports in accordance with Section III.C. of this policy.
- Inform respondents, complainants, and witnesses of the procedural steps in the research misconduct proceeding;
- Appoint the chair and members of the inquiry and investigation committees, ensure that those committees are properly staffed and that there is expertise appropriate to carry out a thorough and authoritative evaluation of the evidence;
- Determine whether each person involved in handling an allegation of research misconduct has an unresolved personal, professional, or financial conflict of interest and take appropriate action, including recusal, to ensure that no person with such conflict is involved in the research misconduct proceeding;
- In cooperation with other institutional officials, take all reasonable and practical steps to protect or restore the positions and reputations of good faith complainants, witnesses, and committee members and counter potential or actual retaliation against them by respondents or other institutional members;
- Keep the Deciding Official and others who need to know apprised of the progress of the review of the allegation of research misconduct;
- Notify and make reports to ORI or other applicable federal agencies as required by 42 CFR Part 93 or other applicable law or regulations;
- Ensure that administrative actions taken by the institution, ORI, or other appropriate agencies are enforced and take appropriate action to notify other involved parties, such as sponsors, law enforcement agencies, professional societies, and licensing boards of those actions; and
- Maintain records of the research misconduct proceeding and make them available to ORI or other appropriate agencies as applicable in accordance with Section VIII.F. of this policy.

B. Complainant

The complainant is responsible for making allegations in good faith, maintaining confidentiality to the extent permitted by law, and cooperating with the inquiry and investigation. As a matter of good practice, the complainant should be interviewed at the inquiry stage and given the transcript of the interview for comment. The complainant must be interviewed during an investigation, and be given the transcript of the interview for comment. The complainant may be provided for comment with (1) relevant portions of the inquiry report (within a timeframe that permits the inquiry to be completed within 60 days of its initiation); and (2) relevant portions of the draft investigation report. In reviewing reports, the complainant must adhere to time limits set by the corresponding committee for timely completion of the inquiry or investigation

C. Respondent

The respondent is responsible for maintaining confidentiality and cooperating with the conduct of an inquiry and investigation. The respondent is entitled to:

- A good faith effort from the RIO to notify the respondent in writing at the time of or before beginning an inquiry;
- An opportunity to comment on the inquiry report and have his/her comments attached to the report;
- Be notified of the outcome of the inquiry, and receive a copy of the inquiry report that includes a copy of, or refers to 42 CFR Part 93 or other applicable law or regulations and the institution's policies and procedures on research misconduct;
- Be notified in writing of the allegations to be investigated within a reasonable time after the determination that an investigation is warranted, but before the investigation begins (within 30 days after the institution decides to begin an investigation), and be notified in writing of any new allegations, not addressed in the inquiry or in the initial notice of investigation, within a reasonable time after the determination to pursue those allegations;
- Be interviewed during the investigation, have the opportunity to correct the recording or transcript, and have the corrected recording or transcript included in the record of the investigation;
- Have a good faith effort made to interview during the investigation any witness who has been reasonably identified by the respondent as having information on relevant aspects of the investigation, have the recording or transcript provided to the witness, have the witness suggest any corrections in the transcript, and have the recording or corrected transcript included in the record of investigation; and
- Receive a copy of the draft investigation report and, concurrently, a copy of, or supervised access to any records or materials on which the report is based, and be notified that any comments must be submitted within 30 days of the date on which the copy was received and that the comments will be considered by the institution and addressed in the final report
- Appeal the decision of the DO as provided in Section XIII.D.

The respondent should be given the opportunity to admit that research misconduct occurred and that he/she committed the research misconduct. With the advice of the RIO and/or other institutional officials, the Deciding Official may terminate the institution's review of an allegation that has been admitted, if the institution's acceptance of the admission and any proposed resolution is approved by ORI or the appropriate federal agency, if required.

D. Deciding Official

The DO will receive the inquiry report and after consulting with the RIO and/or other institutional officials, decide whether an investigation is warranted under this policy, the criteria in 42 CFR § 93.307(d), or other applicable law or regulations. Any finding that an investigation is warranted must be made in writing by the DO and must be provided to ORI or other federal agencies, if required, together with a copy of the inquiry report meeting the requirements of 42 CFR § 93.309, within 30 days of the finding. If it is found that an investigation is not warranted, the DO and the RIO will ensure that detailed documentation of the inquiry is retained for at least 7 years after termination of the inquiry, so that ORI or other applicable agencies may assess the reasons why the institution decided not to conduct an investigation.

The DO will receive the investigation report and, after consulting with the RIO and/or other institutional officials, decide the extent to which

this institution accepts the findings of the investigation and, if research misconduct is found, decide what, if any, institutional administrative actions are appropriate. The DO shall ensure that the final investigation report, the findings of the DO and a description of any pending or completed administrative actions are provided to ORI, as required by 42 CFR § 93.315 or to other federal agencies as required by their respective misconduct policies.

IV. General Policies and Principles

A. Responsibility to Report Misconduct

All institutional members will report observed, suspected, or apparent research misconduct to the RIO, the DO, or their designees. Prior to submitting a formal charge, a potential complainant is encouraged to consult informally with the RIO, the DO, or their designees to consider whether the case involves questions of research misconduct, should be resolved by other University procedures, or does not warrant further action. Contact information for the RIO may be obtained from the Office of Research Support and Sponsored Programs or the listing of Research Council members on the Faculty Senate website. If the circumstances described by the individual do not meet the definition of research misconduct, but further action is required, the RIO will refer the individual or allegation to other offices or officials with responsibility for resolving the problem.

At any time, to the extent permitted by law, an institutional member may have confidential discussions and consultations about concerns of possible misconduct with the RIO, the DO, or their designees and will be counseled about appropriate procedures for reporting allegations and their obligation to cooperate in any inquiry or investigation that may occur.

B. Cooperation with Research Misconduct Proceedings

Institutional members shall cooperate with the RIO and other institutional officials in the review of allegations and the conduct of inquiries and investigations. Institutional members, including respondents, have an obligation to provide evidence relevant to research misconduct allegations to the RIO or other institutional officials.

C. Confidentiality

The RIO shall, as required by 42 CFR § 93.108 or other applicable law or regulation: (1) limit disclosure of the identity of respondents and complainants to those who need to know in order to carry out a thorough, competent, objective and fair research misconduct proceeding; and (2) except as otherwise prescribed by law, limit the disclosure of any records or evidence from which research subjects might be identified to those who need to know in order to carry out a research misconduct proceeding.

D. Conflicts of interest

At each stage of handling an inquiry or subsequent investigation, all persons involved shall be vigilant to prevent any real or perceived conflict of interest, or personal conflicts or relationships between colleagues, from affecting the outcome of the proceedings and resolution of the charges. Possible conflicts of interest may include co-authorship of work within the recent past with any of the individuals directly involved with the alleged misconduct, or professional or personal relationship with the respondent beyond that of mere acquaintances or colleagues. Committee members shall not have had any personal, professional or financial involvement with the matters at issue in the investigation that might create an appearance of bias or actual bias. If such relationships or involvement are present, the individual shall recuse himself or herself from any investigative or decisional role in the case. If any prospective committee member at

any point in the process presents a conflict of interest, that committee member shall be replaced by another appointee. If the RIO has a conflict of interest, the DO shall appoint a replacement; if the DO has a conflict of interest, the Chancellor shall appoint a replacement. The RIO may use a written conflict of interest statement to implement this provision; a sample statement is referenced in the Appendix to this policy.

E. Protecting complainants, witnesses, and committee members

Institutional members may not retaliate in any way against complainants, witnesses, or committee members. Institutional members should immediately report any alleged or apparent retaliation against complainants, witnesses or committee members to the RIO, who shall review the matter and, as necessary, make all reasonable and practical efforts to counter any potential or actual retaliation and protect and restore the position and reputation of the person against whom the retaliation is directed.

F. Protecting the Respondent

As requested and as appropriate, the RIO and other institutional officials shall make all reasonable and practical efforts to protect or restore the reputation of persons alleged to have engaged in research misconduct, but against whom no finding of research misconduct is made.

During the research misconduct proceeding, the RIO is responsible for ensuring that respondents receive all the notices and opportunities provided for in 42 CFR Part 93, or other applicable federal policies, and the policies and procedures of the institution.

G. Adviser to the Respondent

The respondent may consult with an adviser, who may or may not be an attorney. The adviser may not be a principal or witness in the case. The adviser may accompany the respondent to proceedings conducted as a part of the research misconduct proceeding, but shall not speak on behalf of the respondent or otherwise participate in the proceedings. The adviser must maintain confidentiality and be available as needed to ensure that that all proceedings are completed on a timely basis.

H. Interim Administrative Actions and Notifying ORI or Other Federal Agencies of Special Circumstances

Throughout the research misconduct proceeding, the RIO will review the situation to determine if there is any threat of harm to public health, federal funds and equipment, or the integrity of the research process. In the event of such a threat, the RIO will, in consultation with other institutional officials and ORI or other federal agencies, if applicable, take appropriate interim action to protect against any such threat. Interim action might include additional monitoring of the research process and the handling of federal funds and equipment, reassignment of personnel or of the responsibility for the handling of federal funds and equipment, additional review of research data and results or delaying publication. The RIO shall, at any time during a research misconduct proceeding, consult with appropriate University officials and legal counsel immediately if he/she has reason to believe that any of the following conditions exist:

- Health or safety of the public is at risk, including an immediate need to protect human or animal subjects;
- Federal resources or interests are threatened;
- Research activities should be suspended;

- There is a reasonable indication of possible violations of civil or criminal law;
- Federal action is required to protect the interests of those involved in the research misconduct proceeding;
- The research misconduct proceeding may be made public prematurely and federal action may be necessary to safeguard evidence and protect the rights of those involved; or
- The research community or public should be informed.

Following such consultation, the institution shall take appropriate steps to address such conditions, such as by notifying ORI or other applicable agency.

I. Computation of Time

In this policy, any reference to days shall mean calendar days. Any period of time equal to ten days or fewer shall exclude University holidays. If a deadline falls on a weekend or University holiday, the deadline shall be the next University business day.

J. Procedural Changes

1. **Deadlines.** Due to the sensitive nature of allegations of misconduct, each case shall be resolved as expeditiously as possible. The nature of some cases may, however, render normal deadlines difficult to meet. If at any time an established deadline cannot be met, a report shall be filed with the DO setting out the reasons why the deadline cannot be met and estimating when that stage of the process will be completed. A copy of this report shall be provided to the respondent. If PHS funding is involved, an extension must be received from the Office of Research Integrity.
2. **Other Procedural Changes.** Particular circumstances in an individual case may dictate variation from the procedures set out in this policy in order to ensure fair and efficient consideration of the matter. Any change in the procedures must ensure fair treatment of the respondent. Any major deviations from the procedures described in this policy shall be made only with the written approval of the DO in consultation with the respondent. Any minor deviations from the procedures described in this policy shall not require the written approval of the DO.

K. Exclusive Process

The procedures described in this policy constitute the exclusive process for raising and resolving charges of research misconduct.

V. Conducting the Assessment and Inquiry

A. Assessment of Allegations

Upon receiving an allegation of research misconduct, the RIO will immediately assess the allegation to determine whether it is sufficiently credible and specific so that potential evidence of research misconduct may be identified and further review is warranted. The RIO shall also determine whether the alleged misconduct is within the jurisdictional criteria of 42 CFR § 93.102(b), and whether the allegation falls within the definition of research misconduct in 42 CFR § 93.103. An inquiry must be conducted if these criteria are met. In conducting this assessment, the RIO may consult with the institution's legal counsel and other appropriate University officials. If a charge is frivolous, does not raise questions of research misconduct, is more appropriately resolved by other University procedures, or does not warrant further action, the RIO may, at his or her discretion, handle the matter informally or refer it to the appropriate person or process, and will notify the complainant and anyone else known to be aware of the charge.

The assessment period should be brief, preferably concluded within a week. In conducting the assessment, the RIO need not interview the complainant, respondent, or other witnesses, or gather data beyond any that may have been submitted with the allegation, except as necessary to determine whether the allegation is sufficiently credible and specific so that potential evidence of research misconduct may be identified and further review is warranted. The RIO shall, on or before the date on which the respondent is notified of the allegation, obtain custody of, inventory, and sequester all research records and evidence needed to conduct the research misconduct proceeding, as provided in paragraph C. of this section.

B. Initiation and Purpose of the Inquiry

If the RIO determines that the criteria for an inquiry are met, he or she will immediately initiate the inquiry process. The purpose of the inquiry is to conduct an initial review of the available evidence to determine whether to conduct an investigation. An inquiry does not require a full review of all the evidence related to the allegation.

C. Notice to Respondent; Sequestration of Research Records

At the time of or before beginning an inquiry, the RIO must make a good faith effort to notify the respondent in writing, if the respondent is known. With the approval of the respondent, the RIO will also notify the dean of the school or college in which the respondent holds his or her primary appointment. If the inquiry subsequently identifies additional respondents, they must be notified in writing. On or before the date on which the respondent is notified, or the inquiry begins, whichever is earlier, the RIO must take all reasonable and practical steps to obtain custody of all the research records and evidence needed to conduct the research misconduct proceeding, inventory the records and evidence and sequester them in a secure manner, except that where the research records or evidence encompass scientific instruments shared by a number of users, custody may be limited to copies of the data or evidence on such instruments, so long as those copies are substantially equivalent to the evidentiary value of the instruments. The RIO may consult confidentially with the institution's legal counsel and other appropriate University officials for advice and assistance in this regard. In addition, if necessary, the RIO may consult with ORI or other applicable federal agency.

D. Appointment of the Inquiry Committee

The RIO, in consultation with other institutional officials as appropriate, shall appoint an inquiry committee and committee chair as soon after the initiation of the inquiry as is practical. The inquiry committee must consist of individuals who do not have unresolved personal, professional, or financial conflicts of interest with those involved with the inquiry and should include individuals with the appropriate scientific expertise to evaluate the evidence and issues related to the allegation, interview the principals and key witnesses, and conduct the inquiry. The RIO shall notify the respondent of the proposed inquiry committee membership. The respondent may then submit a written objection to any appointed member of the inquiry committee based on bias or conflict of interest within seven days. If an objection is raised, the RIO shall determine whether to replace the challenged member with a qualified substitute. The RIO's decision shall be final. The RIO may, with the concurrence of the DO, appoint one or more experts to assist the inquiry committee if necessary to evaluate specific allegations. The RIO shall direct the members of the committee that the investigation and all information relating to the investigation shall be kept confidential.

E. Charge to the Committee and First Meeting

The RIO will prepare a charge for the inquiry committee that:

- Sets forth the time for completion of the inquiry;
- Describes the allegations and any related issues identified during the allegation assessment;
- States that the purpose of the inquiry is to conduct an initial review of the evidence, including the testimony of the respondent, complainant and key witnesses, to determine whether an investigation is warranted, not to determine whether research misconduct definitely occurred or who was responsible;
- States that an investigation is warranted if the committee determines: (1) there is a reasonable basis for concluding that the allegation falls within the definition of research misconduct and is within the jurisdictional criteria of 42 CFR § 93.102(b), if applicable; and, (2) the allegation may have substance, based on the committee's review during the inquiry.
- Informs the inquiry committee that they are responsible for preparing or directing the preparation of a written report of the inquiry that meets the requirements of this Policy and 42 CFR § 93.309(a), if applicable.

At the committee's first meeting, the RIO will review the charge with the committee, discuss the allegations, any related issues, and the appropriate procedures for conducting the inquiry, assist the committee with organizing plans for the inquiry, and answer any questions raised by the committee. The RIO will be present or available throughout the inquiry to advise the committee as needed. Prior to the first meeting, the RIO shall also consult with legal counsel for the institution as to the need for counsel to provide legal advice to the committee at the first meeting and in subsequent phases of the inquiry, including, but not limited to, for the purpose of reviewing institutional policies governing research misconduct proceedings, confidentiality and potential conflicts of interest.

F. Inquiry Process

The inquiry committee shall interview the complainant and the respondent, and may interview witnesses as well as examine relevant research records and materials. Then the inquiry committee will evaluate the evidence, including the testimony obtained during the inquiry. After consultation with the RIO, the committee members will decide whether an investigation is warranted based on the criteria in this policy and 42 CFR § 93.307(d) as applicable. The scope of the inquiry is not required to and does not normally include deciding whether misconduct definitely occurred, determining definitely who committed the research misconduct or conducting exhaustive interviews and analyses. However, if a legally sufficient admission of research misconduct is made by the respondent, misconduct may be determined at the inquiry stage if all relevant issues are resolved. In that case, the institution shall promptly consult with ORI or other appropriate agencies, as required, to determine the next steps that should be taken. See Section IX.

G. Time for Completion

The inquiry, including preparation of the final inquiry report and the decision of the DO on whether an investigation is warranted, must be completed within 60 days of initiation of the inquiry, unless the RIO determines that circumstances clearly warrant a longer period. If the RIO approves an extension, the inquiry record must include documentation of the reasons for exceeding the 60-day period. The respondent will be notified of the extension.

VI. The Inquiry Report

A. Elements of the Inquiry Report

A written inquiry report must be prepared that includes the following information: (1) the name and position of the respondent; (2) a description of the allegations of research misconduct; (3) the PHS or other federal support, if any, including, for example, grant numbers, grant applications, contracts and publications listing support; (4) the basis for recommending or not recommending that the allegations warrant an investigation; (5) any comments on the draft report by the respondent or complainant. An outline for reports to be furnished to ORI is referenced in the Appendix to this policy.

Institutional counsel shall review the draft inquiry report prior to transmission of the draft to the respondent. Modifications shall be made as appropriate in consultation with the RIO and the inquiry committee. The inquiry report shall include the following information: the names and titles of the committee members and experts who conducted the inquiry; a summary of the inquiry process used; a list of the research records reviewed; summaries of any interviews; and whether any other actions should be taken if an investigation is not recommended.

B. Notification to the Respondent and Opportunity to Comment

The RIO shall notify the respondent whether the inquiry found an investigation to be warranted, together with a copy of the draft inquiry report, and a copy of or reference to 42 CFR Part 93 or other applicable federal policies and the institution's policies and procedures on research misconduct. The report shall clearly be labeled "DRAFT" in bold and conspicuous type font. The RIO shall notify the respondent that the respondent shall have 10 days to comment on the draft inquiry report. The RIO shall also direct the respondent that the draft report shall be kept confidential.

On a case-by-case basis, the RIO may provide the complainant a copy of the draft inquiry report, or relevant portions of it, for comment. If so, the report shall clearly be labeled "DRAFT" in bold and conspicuous type font, and the complainant will be allowed no more than 10 days to submit comments to the RIO. The complainant shall be directed that the draft report shall be kept confidential.

Any comments that are submitted by the respondent or the complainant shall be attached to the final inquiry report. Based on the comments, the inquiry committee may revise the draft report as appropriate and prepare it in final form. The committee will deliver the final report to the RIO. The RIO shall notify the complainant in writing whether the inquiry found an investigation to be warranted.

C. Institutional Decision and Notification

1. Decision by Deciding Official
 - a. The RIO will transmit the final inquiry report and any comments to the DO, who will determine in writing whether an investigation is warranted. The inquiry is completed when the DO makes this determination.
2. Notification to ORI and Respondent
 - a. Within 30 days of the DO's decision that an investigation is warranted, the RIO will provide ORI, if required, with the DO's written decision and a copy of the inquiry report. The RIO shall also provide a copy of the DO's written decision and a copy of the inquiry report to the respondent within 30 days of the DO's decision. Subject to confidentiality, the RIO will also notify those institutional officials, if any, who need to know of the DO's

decision because they will be directly involved in the investigation or otherwise have a need to know because of their official duties. The RIO must provide the following information to ORI, if required, or other applicable federal agency upon request: (1) the institutional policies and procedures under which the inquiry was conducted; (2) the research records and evidence reviewed, transcripts or recordings of any interviews, and copies of all relevant documents; and (3) the charges to be considered in the investigation.

3. Documentation of Decision Not to Investigate

- a. If the DO decides that an investigation is not warranted, the RIO shall secure and maintain for 7 years after the termination of the inquiry sufficiently detailed documentation of the inquiry to permit a later assessment by applicable federal agencies of the reasons why an investigation was not conducted. These documents must be provided to such agencies or their authorized personnel upon request.

VII. Conducting the Investigation

A. Initiation and Purpose

The investigation must begin within 30 days, after the determination by the DO that an investigation is warranted. The purpose of the investigation is to develop a factual record by exploring the allegations in detail and examining the evidence in depth, leading to recommended findings on whether research misconduct has been committed, by whom, and to what extent. The investigation will also determine whether there are additional instances of possible research misconduct that would justify broadening the scope beyond the initial allegations. This is particularly important where the alleged research misconduct involves clinical trials or potential harm to human subjects or the general public or if it affects research that forms the basis for public policy, clinical practice, or public health practice. The findings of the investigation must be set forth in an investigation report.

B. Notifying ORI and Respondent; Sequestration of Research Records

On or before the date on which the investigation begins, the RIO must: (1) notify the ORI Director of the decision to begin the investigation and provide ORI a copy of the inquiry report, if required; and (2) notify the respondent in writing of the allegations to be investigated. The RIO must also give the respondent written notice of any new allegations of research misconduct within a reasonable amount of time of deciding to pursue allegations not addressed during the inquiry or in the initial notice of the investigation.

The RIO will, prior to notifying respondent of the allegations, take all reasonable and practical steps to obtain custody of and sequester in a secure manner all research records and evidence needed to conduct the research misconduct proceeding that were not previously sequestered during the inquiry. The need for additional sequestration of records for the investigation may occur for any number of reasons, including the institution's decision to investigate additional allegations not considered during the inquiry stage or the identification of records during the inquiry process that had not been previously secured. The procedures to be followed for sequestration during the investigation are the same procedures that apply during the inquiry.

C. Appointment of the Investigation Committee

The RIO, in consultation with other institutional officials as appropriate, will appoint an investigation committee and the committee chair as soon

after the beginning of the investigation as is practical. The investigation committee must consist of at least three individuals who do not have unresolved personal, professional, or financial conflicts of interest with those involved with the investigation and should include individuals with the appropriate scientific expertise to evaluate the evidence and issues related to the allegation, interview the respondent and complainant and conduct the investigation. Individuals appointed to the investigation committee may also have served on the inquiry committee. When necessary to secure the necessary expertise or to avoid conflicts of interest, the RIO may select committee members from outside the institution, or, with concurrence of the DO, may appoint experts to assist the committee in particular aspects of the case. The RIO will notify the respondent of the proposed investigation committee membership and any appointed experts. If the respondent then submits a written objection to any appointed member or expert based on bias or conflict of interest within seven days, the RIO will determine whether to replace the challenged member or expert with a qualified substitute, and the decision of the RIO shall be final.

D. Charge to the Committee and the First Meeting

1. Charge to the Committee

The RIO will define the subject matter of the investigation in a written charge to the committee that:

- Describes the allegations and related issues identified during the inquiry;
- Identifies the respondent;
- Informs the committee that it must conduct the investigation as prescribed in paragraph E. of this section;
- Reviews the definition of research misconduct as stated in this Policy;
- Informs the committee that it must evaluate the evidence and testimony to determine whether, based on a preponderance of the evidence, research misconduct occurred and, if so, the type and extent of it and who was responsible;
- Informs the committee that in order to determine that the respondent committed research misconduct it must find that a preponderance of the evidence establishes that: (1) research misconduct, as defined in this policy, occurred (respondent has the burden of proving by a preponderance of the evidence any affirmative defenses raised, including honest error or a difference of opinion); (2) the research misconduct is a significant departure from accepted practices of the relevant research community; and (3) the respondent committed the research misconduct intentionally, knowingly, or recklessly; and
- Informs the committee that it must prepare or direct the preparation of a written investigation report that meets the requirements of this Policy and any other applicable federal policies, such as 42 CFR § 93.313.

2. First Meeting

The RIO will convene the first meeting of the investigation committee to review the charge, the inquiry report, and the prescribed procedures and standards for the conduct of the investigation, including the necessity for developing a specific investigation plan. The RIO shall also direct the members of the committee that the investigation and all information relating to the investigation shall be kept confidential. The investigation committee will be provided with a copy of this statement of policy and procedures and any applicable federal research misconduct policies. The RIO will be present or available throughout the investigation to

advise the committee as needed. Prior to the first meeting, the RIO shall also consult with legal counsel for the institution as to the need for counsel to provide legal advice to the committee at the first meeting and in subsequent phases in the investigation, including, but not limited to, for the purpose of reviewing institutional policies governing research misconduct proceedings, confidentiality and potential conflicts of interest.

E. Investigation Process

The investigation committee and the RIO must:

- Use diligent efforts to ensure that the investigation is thorough and sufficiently documented and includes examination of all research records and evidence relevant to reaching a decision on the merits of each allegation;
- Take reasonable steps to ensure an impartial and unbiased investigation to the maximum extent practical;
- Interview each respondent, complainant, and make a good-faith effort to interview any other available person who has been reasonably identified as having information regarding any relevant aspects of the investigation, including witnesses identified by the respondent, and record or transcribe each interview, provide the recording or transcript to the interviewee for correction, and include the recording or transcript in the record of the investigation; and
- Pursue diligently all significant issues and leads discovered that are determined relevant to the investigation, including any evidence of any additional instances of possible research misconduct, and continue the investigation to completion.

F. Time for Completion

The investigation is to be completed within 120 days of the first meeting of the investigation committee, including conducting the investigation, preparing the report of findings, providing the draft report for comment and sending the final report to ORI, if applicable. However, if the RIO determines that the investigation will not be completed within this 120-day period, he/she will submit a written request for an extension to the DO and to ORI or other applicable federal agencies, setting forth the reasons for the delay. If the request for an extension is approved by the DO and applicable federal agencies, then the RIO will ensure that periodic progress reports are filed with the approving officials.

G. Amended Charges

If issues of research misconduct that fall outside of the charge arise during the course of the investigation, the committee shall so inform the RIO, including in its communication the evidence on which its concerns are based. The RIO in consultation with the DO and the investigation committee, will consider the issues raised and, in the RIO's discretion, provide the investigation committee with an amended charge. The respondent shall be notified of any such amendments.

VIII. The Investigation Report

A. Elements of the Investigation Report

The investigation committee and the RIO are responsible for preparing a written draft report of the investigation that:

- Describes the nature of the allegation of research misconduct, including identification of the respondent and the respondent's curriculum vitae;
- Describes and documents the federal support, if any, including, for example, the numbers of any grants that are involved, grant applications, contracts, and publications listing federal support;

- Describes the specific allegations of research misconduct considered in the investigation;
- Includes the institutional policies and procedures under which the investigation was conducted;
- Identifies and summarizes the research records and evidence reviewed and identifies any evidence taken into custody but not reviewed; and
- Includes a statement of findings for each allegation of research misconduct identified during the investigation. Each statement of findings must: (1) identify whether the research misconduct was falsification, fabrication, or plagiarism, and whether it was committed intentionally, knowingly, or recklessly; (2) summarize the facts and the analysis that support the conclusion and consider the merits of any reasonable explanation by the respondent, including any effort by respondent to establish by a preponderance of the evidence that he or she did not engage in research misconduct because of honest error or a difference of opinion; (3) identify the specific federal support, if any; (4) identify whether any publications need correction or retraction; (5) identify the person(s) responsible for the misconduct; and (6) list any current support or known applications or proposals for support that the respondent has pending with federal agencies.
- If the committee determines that any allegation of research misconduct is true, the report shall recommend appropriate institutional actions in response to the findings of research misconduct.

The report and other retained documentation must be sufficiently detailed as to permit a later assessment of the investigation. An outline for reports to be furnished to ORI is referenced in the Appendix to this Policy.

B. Comments on the Draft Report and Access to Evidence

The RIO must give the respondent a copy of the draft investigation report for comment and, concurrently, a copy of, or supervised access to the evidence on which the report is based. The report shall clearly be labeled "DRAFT" in bold and conspicuous type font. The respondent will be allowed 30 days from the date he/she received the draft report to submit comments to the RIO. The respondent's comments must be considered and made a part of the final investigation record. The respondent shall be directed that the draft report shall be kept confidential.

On a case-by-case basis, the RIO may provide the complainant a copy of the draft investigation report, or relevant portions of it, for comment. If so, the report shall clearly be labeled "DRAFT" in bold and conspicuous type font, and the complainant will be allowed no more than 30 days from the date on which he/she received the draft report to submit comments to the RIO. The complainant's comments must be included and considered in the final report. The complainant shall be directed that the draft report shall be kept confidential.

C. Decision by Deciding Official

The RIO will assist the investigation committee in finalizing the draft investigation report, including ensuring that the respondent's and, if applicable, complainant's comments are included and considered, and transmit the final investigation report to the DO, who will determine in writing: (1) whether the institution accepts the investigation report, its findings, and the recommended institutional actions; and (2) the appropriate institutional actions in response to the accepted findings of research misconduct. If this determination varies from the findings of the investigation committee, the DO will, as part of his/her written determination, explain in detail the basis for rendering a decision different

from the findings of the investigation committee. Alternatively, the DO may return the report to the investigation committee with a request for further fact-finding or analysis. When a final decision on the case has been reached, whether at this stage or after a subsequent appeal, the RIO will notify the respondent in writing. If the DO's findings are not appealed within ten days, the DO's findings shall become the institution's final decision. At the time of a final decision, whether at this stage or after an appeal, the RIO will also notify the complainant in writing of the final outcome of the case. After informing ORI or other applicable federal agency, as required, the DO will determine whether law enforcement agencies, professional societies, professional licensing boards, editors of journals in which falsified reports may have been published, collaborators of the respondent in the work, or other relevant parties should be notified of the outcome of the case. The RIO is responsible for ensuring compliance with all notification requirements of funding or sponsoring agencies.

D. Appeals

The respondent, within ten days of receiving written notification of the decision of the DO, may file an appeal with the Chancellor. The appeal may result in (i) a reversal or modification of the DO's findings of research misconduct or determinations of institutional action, (ii) the Chancellor may direct the DO to return the report to the investigation committee with a request for further fact-finding or analysis, or (iii) other action the Chancellor deems appropriate. The appeal process must be completed within 120 days of the filing of the appeal unless an extension is granted by appropriate officials and federal agencies. The decision of the Chancellor shall be final.

E. Notice to Federal Agencies of Institutional Findings and Actions

Unless an extension has been granted, the RIO must, within the 120-day period for completing the investigation or the 120-day period for completion of an appeal, submit the following to any applicable federal agencies as required: (1) a copy of the investigation report with all attachments and any appeals; (2) the findings of research misconduct, including who committed the misconduct; (3) a statement of whether the institution accepts the findings of the investigation; and (4) a description of any pending or completed administrative actions against the respondent.

F. Maintaining Records for Review by Federal Agencies

If required, the RIO must maintain and provide to ORI, if required, or other applicable federal agencies upon request "records of research misconduct proceedings" as that term is defined by 42 CFR § 93.317 or other applicable policies, as appropriate. Unless custody has been transferred to an appropriate federal agency or such agency has advised in writing that the records no longer need to be retained, records of research misconduct proceedings must be maintained in a secure manner for 7 years after completion of the proceeding or the completion of any federal proceeding involving the research misconduct allegation. The RIO is also responsible for providing any information, documentation, research records, evidence or clarification requested by ORI or other appropriate federal agency to carry out its review of an allegation of research misconduct or of the institution's handling of such an allegation.

IX. Completion of Cases; Reporting Premature Closures to Federal Agencies

Generally, all inquiries and investigations will be carried through to completion and all significant issues will be pursued diligently. A case may be closed at the inquiry stage if it is determined that an investigation is

not warranted. A case may be closed at the investigation stage if there is a finding that no research misconduct was committed. If the alleged misconduct was in the jurisdiction of the ORI or other federal agency, then this finding must be reported to the applicable agency. An advance notification by the RIO to any applicable federal agency must be made if there are plans to close a case at the inquiry, investigation, or appeal stage on the basis that respondent has admitted guilt, a settlement with the respondent has been reached, or for any other reason except those noted above.

X. Institutional Administrative Actions

If the DO and any subsequent appeal determine that research misconduct is substantiated by the findings, then the DO will decide on the appropriate actions to be taken, after consultation with the RIO and the Chancellor. The administrative actions may include, but are not limited to, the following:

- Withdrawal or correction of all pending or published abstracts and papers emanating from the research where research misconduct was found;
- Removal of the responsible person from the particular project, letter of reprimand, special monitoring of future work, probation, suspension, salary reduction, or initiation of steps leading to possible rank reduction or termination of employment;
- Restitution of funds to the grantor agency as appropriate; and
- Other action appropriate to the research misconduct.

XI. Other Considerations

A. Termination or Resignation Prior to Completing Inquiry or Investigation

The termination of the respondent's institutional employment, by resignation or otherwise, before or after an allegation of possible research misconduct has been reported, will not preclude or terminate the research misconduct proceeding or otherwise limit any of the institution's responsibilities under 42 CFR Part 93 or the corresponding research misconduct policies of other federal agencies.

If the respondent, without admitting to the misconduct, elects to resign his or her position after the institution receives an allegation of research misconduct, the assessment of the allegation will proceed, as well as the inquiry and investigation, as appropriate based on the outcome of the preceding steps. If the respondent refuses to participate in the process after resignation, the RIO and any inquiry or investigation committee will use their best efforts to reach a conclusion concerning the allegations, noting in the report the respondent's failure to cooperate and its effect on the evidence.

B. Restoration of the Respondent's Reputation

Following a final finding of no research misconduct, including ORI concurrence where required by 42 CFR Part 93 or other federal agencies, if required, the RIO must, at the request of the respondent, undertake all reasonable and practical efforts to restore the respondent's reputation. Depending on the particular circumstances and the views of the respondent, the RIO should consider notifying those individuals aware of or involved in the investigation of the final outcome, publicizing the final outcome in any forum in which the allegation of research misconduct was previously publicized, and expunging all reference to the research misconduct allegation from the respondent's personnel file. Any

institutional actions to restore the respondent's reputation should first be approved by the DO.

C. Protection of the Complainant, Witnesses and Committee Members

During the research misconduct proceeding and upon its completion, regardless of whether the institution or ORI determines that research misconduct occurred, the RIO must undertake all reasonable and practical efforts to protect the position and reputation of, or to counter potential or actual retaliation against, any complainant who made allegations of research misconduct in good faith and of any witnesses and committee members who cooperate in good faith with the research misconduct proceeding. The DO will determine, after consulting with the RIO, and with the complainant, witnesses, or committee members, respectively, what steps, if any, are needed to restore their respective positions or reputations or to counter potential or actual retaliation against them. The RIO is responsible for implementing any steps the DO approves.

D. Allegations Not Made in Good Faith

If relevant, the DO will determine whether the complainant's allegations of research misconduct were made in good faith, or whether a witness or committee member acted in good faith. If the DO determines that there was an absence of good faith he/she will determine whether any administrative action should be taken against the person who failed to act in good faith.

Appendix

A. Summary of Items that must be Reported or Submitted to the ORI in those Cases Covered by 42 CFR Part 93

(Note: This list is subject to modification based on adherence to current ORI regulations.)

- An annual report containing the information specified by ORI on the institution's compliance with the final rule. Section 93.302(b).
- Within 30 days of finding that an investigation is warranted, the written finding of the responsible official and a copy of the inquiry report. Sections 93.304(d), 93.309(a), and 93.310(a) and (b).
- Where the institution has found that an investigation is warranted, the institution must provide to ORI upon request: (1) the institutional policies and procedures under which the inquiry was conducted; (2) the research records and evidence reviewed, transcripts or recordings of any interviews, and copies of all relevant documents; and (3) the charges for the investigation to consider. Section 93.309.
- Periodic progress reports, if ORI grants an extension of the time limits on investigations or appeals and directs that such reports be submitted. Sections 93.311(c) and 93.314(c).
- Following completion of the investigation report or any appeal: (1) a copy of the investigation report with all attachments and any appeals; (2) the findings of research misconduct, including who committed the misconduct; (3) a statement of whether the institution accepts the findings of the investigation; and (4) a description of any pending or completed administrative actions against the respondent. Section 93.315.
- Upon request, custody or copies of records relevant to the research misconduct allegation, including research records and evidence. Section 93.317(c).
- Notify ORI immediately of the existence of any of the special circumstances specified in Section 93.318.

- Any information, documentation, research records, evidence or clarification requested by ORI to carry out its review of an allegation of research misconduct or the institution's handling of such an allegation. Section 93.400(b).

B. Outline for an Inquiry/Investigation Report for ORI

(Note: A recommended outline for inquiry and investigation reports has been furnished by ORI and is available on the Research Support and Sponsored Programs web site. Committee members should consult this outline in preparing reports. The outline is subject to modification based on adherence to current ORI regulations.)

C. Conflict of Interest Statement

(Note: A sample conflict of interest statement is available on the Research Support and Sponsored Programs web site. This statement shall be provided to the RIO for use in implementing the conflict of interest portions of this policy.)

Reporting Sexual Misconduct

For allegations of sexual misconduct, including, but not limited to, sexual harassment or acts of sexual assault, domestic violence, dating violence, stalking and other forms of sex/gender discrimination, the University has designated a Title IX Coordinator with overall responsibility for oversight of the University's compliance with its obligations under Title IX. All complaints or any concerns about sexual conduct should be submitted to the university's Title IX Coordinator, the Department of Education's Assistant Secretary for Civil Right, or both:

Liz Means

Title IX Coordinator
405 Administration Building
University of Arkansas
Fayetteville, AR 72701
Office: 479-575-7111
Cell: 479-409-9972
Email: edavisme@uark.edu
Alternate e-mail for Title IX: titleix@uark.edu

U.S. Department of Education
Office of Civil Rights
1-800-421-3481
ocr@ed.gov

Degree Requirements

The faculty of the Graduate School, under the authorization of the Board of Trustees, grants the degrees listed below. In addition, the faculty of the Graduate School offers several non-degree graduate certificates. The graduate faculty, as represented by the Dean of the Graduate School and through the Graduate Council, has primary responsibility for the development, operating policies, administration, and quality of these programs. Operating through the Graduate Dean, the faculty appoints committees that directly supervise the student's program of study and committees that monitor research activities and approve theses and dissertations.

Doctoral Degrees

The degree of Doctor of Philosophy (Ph.D.) is conferred for advanced graduate work in a variety of disciplines including animal science; anthropology; biology; business administration; cell and molecular biology; chemistry; community health promotion; comparative literature;

computer science; counselor education; crop, soil and environmental science; curriculum and instruction; economics; engineering; educational statistics and research methods; English; entomology; environmental dynamics; food science; geosciences; history; kinesiology; mathematics; microelectronics-photonics; philosophy; physics; plant science; poultry science; psychology; public policy; rehabilitation; and space and planetary sciences. See the Ph.D. and Ed.D Degrees tab above for general requirements.

The degree of Doctor of Education (Ed.D.) is conferred for advanced professional proficiency in a selected field of education. See the Ph.D. and Ed.D Degrees tab above for general requirements.

The degree of Doctor of Nursing Practice (D.N.P.) is conferred for professional proficiency in the area of advanced nursing practice.

The degree of Doctor of Occupational Therapy (O.T.D.) is conferred for entry-level professional proficiency in the area of clinical occupational therapy.

Specialist Degree

The degree of Education Specialist (Ed.S.) is conferred for specialization in one of two areas: curriculum and instruction and educational leadership. See the Specialist Degrees tab above for general requirements.

Master's Degrees

The degree of Master of Arts (M.A.) is conferred for graduate work of which the major portion has been done in the liberal arts. For general degree requirements, see the Master's Degrees tab above.

The degree of Master of Science (M.S.) is conferred for graduate work of which the major portion has been done in agriculture, educational statistics and research methods, engineering, kinesiology, health science, counseling, rehabilitation, human environmental sciences, biological and physical sciences, statistics, operations management, and communication disorders. For general degree requirements, see the Master's Degrees tab above.

The degree of Master of Accountancy (M.Acc.) is conferred upon a student who completes an approved program of graduate studies in accounting. See the general degree requirements for M.Acc. degree (p. 372).

The degree of Master of Arts in Teaching (M.A.T.) is conferred upon a student who majors in childhood education or secondary education. See the Master's Degree tab above.

The degree of Master of Business Administration (M.B.A.) is conferred upon a student whose major work is in the field of business. See the general degree requirements for M.B.A. degree (p. 380).

The degree of Master of Education (M.Ed.) is conferred upon a student who majors in the field of education. For general degree requirements, see the Master's Degrees tab above.

The degree of Master of Information Systems (M.I.S.) is conferred upon a student who completes an approved program in information systems. See the general degree requirements for M.I.S. degree (p. 392).

The degree of Master of Music (M.M.) is conferred upon a student who completes an approved program of graduate studies in music. See the general degree requirements for M.M. degree (p. 226).

The Master of Public Administration and Nonprofit Studies (M.P.A.) is conferred upon a student who completes an approved program of graduate studies in the field of public administration. See the general degree requirements for M.P.A. degree (p. 278).

The degree of Master of Fine Arts (M.F.A.) in art, creative writing, drama, or translation is conferred upon a student who completes an approved program of graduate studies in these areas. General policies and procedures for a Master of Fine Arts degree are the same as for the Master of Arts. See the individual M.F.A. programs in Art (p. 33), Creative Writing (p. 95) and Theatre (p. 324).

The Master of Science in Nursing (M.S.N.) is conferred upon a student who completes an approved program of graduate studies in this area. See the general degree requirements for M.S.N. degree (p. 238).

The degree of Master of Social Work (M.S.W.) is conferred upon a student who completes an approved program of graduate studies in this area. See the general degree requirements for M.S.W. degree (p. 299).

Graduate Certificates (Non-degree)

As defined by the Arkansas Department of Higher Education, graduate certificate programs consist of 12 to 21 hours of required course work in a focused area of study. The awarding of the certificate will be shown on the student's transcript. Students must meet the admission requirements of the Graduate School and the certificate program. Students who enter a graduate certificate program may use up to six hours of course work taken at another accredited university to meet certificate requirements, with approval of the program faculty and the Graduate School. The Graduate School does not impose a limit on the number of hours that may be shared between graduate certificate programs, but a limit may be set by the program. Students who enter a graduate certificate program must complete all certificate requirements within six years of admission to the program. For students who have been admitted to both a graduate degree program and a graduate certificate program, courses taken to meet the requirements of one may also be used to meet the requirements of the other, at the discretion of the program and the student's Advisory Committee. Graduate students fully admitted to a graduate certificate program are allowed to use 6 hours of credit to count for both an undergraduate degree and a graduate certificate. All requirements of this retroactive graduate credit policy will apply and a transcript notation will note that the courses may not be used to fulfill requirements for a graduate degree. See the list of Graduate Certificates (p. 13) offered.

Master's Degrees Master of Accountancy

See the Master of Accountancy program (p. 372).

Master of Arts and Master of Science

General minimum requirements of the Graduate School follow for the degrees of Master of Arts and Master of Science – including the several engineering degrees. Program requirements may be higher. Note: For degree requirements in the Master of Arts in Economics, see the Graduate School of Business.

1. 24 graduate semester hours and a thesis, or 30 semester hours without a thesis. (The thesis may be a departmental requirement or may be required by the major adviser.)
2. At least 50 percent of the credits (whether coursework or research) must be at the 5000 level or above.

3. No more than 50 percent of the credits may be online unless the program has been approved for online delivery.
4. A comprehensive examination.
5. A cumulative grade-point average of 2.85. (Individual departments may have higher grade standards.)

Program of Study. At the time of admission to the Graduate School and acceptance in a program of study leading to a graduate degree, the student is assigned to a major adviser. The choice of a major adviser is largely determined by the student's choice of a major subject.

The program of study may consist of courses chosen from one department or it may include such cognate courses from other departments as may in individual instances seem to offer greatest immediate and permanent value. As a general principle, two-thirds of the courses come from the degree program in which the student is seeking a graduate degree. The program of study must be approved by the student's Advisory Committee or, depending on program requirements, the Thesis Committee. No more than six hours of special problems (individual study) courses may count toward a 30 hour master's degree.

A student who writes a master's thesis must register for a minimum of six semester hours of master's thesis. No more than six semester hours of master's thesis enrollment may be given credit in the degree program.

Students wishing to take 3000-level undergraduate courses for graduate credit will find the necessary forms on the Graduate School website (<http://www.uark.edu/grad/>). Courses numbered at the 3000 level may be taken by graduate students for graduate credit only when the courses are not in the student's major area of study and when the courses have been approved by the Dean of the Graduate School for graduate credit. The instructor for the course must hold graduate faculty status and must certify that he/she will make appropriate adjustments in assignments and grading scales to raise the level of expectation for the student to the graduate level. No more than 20 percent of the graded course work in the degree program may be comprised of 3000-level courses carrying graduate credit. Undergraduate courses numbered below 3000 will not be allowed to carry graduate credit.

Students wishing to take 4000-level undergraduate courses for graduate credit will find the necessary forms on the Graduate School website (<http://www.uark.edu/grad/>). The instructor for the course must hold graduate faculty status and must certify that he/she will make appropriate adjustments in assignments and grading scales to raise the level of expectation for the student to the graduate level. However, students should be aware that a minimum of 50% of the semester hours presented for the graduate degree must be at the 5000 level or above and in the student's field of study. Individual degree programs may have more stringent requirements.

Under ordinary circumstances graduate registration is limited to 18 hours for any one semester including undergraduate courses and courses audited. Registration above 15 hours must be approved by the Graduate Dean.

All requirements for a master's degree must be satisfied within six consecutive calendar years from the first semester of enrollment in the program.

Transfer of Credit. The University of Arkansas will permit a student to transfer six hours of graduate credit for a 30-hour degree program (12 hours for a 60-hour degree program) from an accredited graduate school in the United States as part of the master's program, provided that the grades are "B" or better, the courses were taken within six years previous

to the conferral of the current degree, and the subjects are acceptable to the program concerned. (The transfer of graduate credit from institutions outside the United States is at the discretion of the Graduate Dean.) This does not, however, reduce the residency requirement of a minimum of 24 graduate course hours for the master's degree as set by state law. Students contemplating transfer of credit should consult with the Graduate School Office in advance. Please see transfer of credit regulations, below.

Transfer of Credit Regulations Established by the Graduate School for the Various Master's Degrees:

Criteria for Acceptable Transfer Credit:

1. Only graded courses (not research hours) are subject to transfer.
2. The course must have been regularly offered (not special problems or individual study) by a regionally accredited graduate school.
3. The course must have been a bona fide graduate level course, approved for graduate credit and taught by a member of the graduate faculty.
4. The course must appear on an official transcript as graduate credit from the institution offering the course.
5. The course grade must be a "B" or "A." (The student's grade-point average is NOT to include grades on transfer courses.)
6. The course must be recommended by the student's major adviser and be applicable to the degree requirement at the University of Arkansas.
7. The course must not have been taken by correspondence or for extension credit.
8. The course must be acceptable to the department concerned and to the Graduate Dean.
9. The student must have satisfied the 24-credit hour residence requirement. (The student must have satisfactorily completed a total of 24 hours of graduate course work taken in residence.)
10. The course must have been taken within the six-year time limit of the student's program at the University of Arkansas.

Petition for the transfer of credit from foreign universities may be made to the Graduate Dean by the department/program.

Graduate credit cannot be transferred to satisfy any of the requirements for the Master of Accountancy, Master of Business Administration, Master of Information Systems, or M.A. in Economics degrees unless the school at which the course was taken is accredited by A.A.C.S.B. Other accredited graduate programs have the discretion to deny transfer credit from non-accredited programs.

Ex Officio Committee Members: Student committees may contain *ex officio* members who have graduate faculty status on the University of Arkansas campus. However, when a person does not hold graduate faculty status on the University of Arkansas campus, he/she may still be allowed to hold an *ex officio* position on a student's committee, in accordance with the following policy: When a committee member does not hold graduate faculty status at the University of Arkansas, he/she will be allowed to serve on a student's master's thesis or doctoral dissertation committee, in addition to the minimum number of members required by the Graduate School or the department/program. The *ex officio* member will be allowed to sign the thesis or dissertation and his/her vote will be recorded but will not be binding for conferring the degree. This use of the term *ex officio* will indicate that the person does not hold graduate faculty status at the University of Arkansas and is serving in an honorary role.

Conflict of Interest Policies: Students should be aware that the Graduate School has policies pertaining to the composition of advisory

and thesis committees. These may be found in the Graduate Student Handbook on the Graduate School website. It should also be noted that to avoid the perception of a conflict of interest, students are discouraged from providing refreshments and faculty are discouraged from creating the expectations that students will provide refreshments during oral defenses.

Residence Requirements. The candidate must present a minimum of 24 course hours taken at the University of Arkansas, Fayetteville. Acceptance of transferred credit does not reduce the minimum residence requirement of 24 course hours taken at the University of Arkansas, Fayetteville.

Thesis. The title of the thesis must be recommended by the thesis director and the thesis committee and be approved by the Dean of the Graduate School at least three months before the date of the comprehensive examination. The thesis must be submitted for approval to the thesis committee consisting of a minimum of three faculty members who have been approved by the Dean of the Graduate School. This committee must receive the thesis in time for the student to defend the thesis and submit it to the Graduate School by the posted deadline date. In order for a thesis to be submitted to the Graduate School, a majority of the thesis committee members, including the thesis adviser (chair of the thesis committee), must have voted to approve the thesis submission and the final oral defense of the thesis. If a student feels that the major adviser (chair of the thesis committee) is preventing completion of the thesis unreasonably, the student may appeal to the Graduate Dean for resolution of the matter. For instructions on submitting an approved thesis, students should consult the Graduate School's *Guide to Preparing Theses and Dissertations*. Students will be required to submit their theses to University Microfilms Incorporated (UMI/ProQuest). There may be an additional charge for this submission. We expect the thesis to be written in English. Under exceptional circumstances, another language may be used if prior approval is obtained from the Dean of the Graduate School. A request to write in a language other than English should be submitted to the Dean of the Graduate School by the student's thesis committee, with endorsement by the department/program head/chair/director. The request should include a proposal and justification for the exception. In all cases, one thesis abstract must be written in English and the defense of the thesis must be in English. Programs wishing to be eligible for their students to submit theses in languages other than English shall seek approval in advance from the Graduate Council.

Comprehensive Examination/Thesis Defense. In addition to completing other requirements, the candidate for a master's degree must take a comprehensive examination, which may be oral and/or written as recommended by the major department. If the student has completed a thesis, the final defense of the thesis must be oral. This can substitute for the comprehensive examination, if the department so chooses. If the final defense of the thesis substitutes for the comprehensive examination, the examination may include other aspects of the candidate's graduate work. All members of the thesis committee (and advisory committee, if the thesis defense substitutes for the comprehensive examination) must participate in the thesis defense unless the Dean of the Graduate School has approved an exception. If a committee member does not participate in the final oral defense, that person will be asked by the Graduate School to resign from the committee. While this final oral defense will not be posted on the website of the Graduate School and open to the general public, as is allowed with the doctoral dissertation defense, members of the student's degree program and/or department, as well as other affiliated areas, may be invited to the defense by the thesis committee chair. The thesis committee chair may disallow inappropriate questions from the guests.

Students may elect to participate by distance through electronic means in their final oral defense of the thesis, if approved by the thesis faculty director. In advance of the final oral defense, the student must provide to the Graduate School a written, signed statement that he/she has elected this option.

The Use of Copy Editors in Theses. The Graduate School at the University of Arkansas does not forbid the use of copy editors (see definition below) for theses and dissertations under the following conditions:

1. Any use of copy editors for theses and dissertations must be approved by the thesis/dissertation committee and the department/program chair/head/director.
2. The student understands that there is a difference between legitimate editing and violations of academic integrity policies and is responsible for ensuring that the line is not crossed.

*Note: The Graduate School considers it to be a violation of our academic integrity policy to use copy editors in any Graduate School required exam (e.g. comprehensive exam, candidacy exam).

Definition of copy editors: copy editors review written material for accuracy, readability, coherence and relevance as well as for errors of spelling and grammar. This policy refers to the provision of such services regardless of by whom they are provided and regardless of whether the copy editor is paid or unpaid. (Members of the thesis/dissertation committee are exempt from this definition.)

Grades. All courses included in a student's program of study for a degree must have an acceptable grade (a letter grade of A, B, or C, or a mark of CR). A mark of 'S' does not carry degree credit and any course with a mark of 'S' cannot be included in the final program of study. If the course is to be included in a program of study, the mark of 'S' must be changed to an acceptable grade or a mark of CR, although no more than six hours of CR may be accepted toward the requirements for a graduate degree. Please note that all work for the course must have been submitted by the student to the instructor by the last day of final examinations in order to be eligible for graduation for that specific semester.

Grade-Point Average. To receive a master's degree, a candidate must present a minimum cumulative grade-point average of 2.85 on all graduate courses required for the degree, unless the department requires a higher grade point average. Failing to earn such an average on the minimum number of hours, the student is permitted to present up to six additional hours of graduate credit to accumulate a grade-point average of 2.85. In the computation of grade point, all courses pursued at this institution for graduate credit (including any repeated courses) shall be considered. Students who repeat a course in an endeavor to raise their grade must count the repetition toward the maximum of six additional hours. Students should also be aware that they may not use for degree credit any course in which they received a grade of D or F. There is no grade forgiveness policy at the graduate level at the University of Arkansas. Individual departments may have higher grade standards.

Split Decisions among Advisory and Thesis Committees. When a split decision occurs among committee members of a master's advisory or thesis committee, the majority decision will hold.

Sharing Courses Between Two Degrees. When a student earns two master's degrees, no more than six hours of course work may be used to satisfy the requirements of both degrees, i.e. shared between the

degrees. This rule pertains whether the course work is taken on the University of Arkansas campus or is transferred from another university.

Master of Arts in Teaching

The Master of Arts in Teaching (M.A.T.) degree is an initial teacher certification program and has two licensure areas: elementary education and secondary education. The M.A.T. is a 33-semester-hour degree offered to a cohort of students in consecutive summer, fall, and spring semesters with initial enrollment in the summer semester.

Admission Requirements: Students are selected up to the maximum number designated for each cohort in the licensure area. Admission requirements for the M.A.T. degree for initial certification are: completion of an appropriate undergraduate degree program; a minimum cumulative grade-point average of 3.0 in the last 60 hours completed for the baccalaureate degree; admission to the Graduate School; admission to a Teacher Education program; completion of the pre-education core with a minimum of a “C” grade in all courses; completion of all prerequisite courses in the teaching field; clearance through the Office of Teacher Education, which includes passing score(s) on the Math, Reading, and Writing sections of the Praxis Core or ACT/SAT/GRE; successful completion of the required criminal background checks.

Program Requirements: All M.A.T. students complete 27 credit hours of coursework in the licensure area, 6 credit hours of internship, and a culminating project. To receive the degree, a candidate must present a minimum cumulative grade-point average of 3.0 on all graduate courses required for the degree. Students may not present for degree credit any course in which they earned a grade of D or F.

For information on each licensure area (elementary and secondary), refer to the sections of this catalog on M.A.T. in Elementary Education and M.A.T. in Teacher Education (secondary) in the Department of Curriculum and Instruction.

Admission to candidacy, residence requirements, and other requirements are the same as for the Master of Education degree.

Teacher Licensure and Licensure of Other School Personnel: The Arkansas State Board of Education issues the regulations governing the licensure of teachers in Arkansas. The Board specifies minimum cut-off scores for the Praxis I and Praxis II exams. Each application for a teacher’s license or a request to add an additional license or endorsement area requires completion of an approved program of study and documentation of passing the Praxis exams.

The Coordinator of Teacher Education will recommend students for initial teacher license who have submitted the licensing packet and successfully completed the appropriate approved program and all state licensure requirements. Those interested in seeking an additional license or endorsement should contact the Coordinator of Teacher Education at G-22 Stone House South, 479-575-6740, or the Arkansas Department of Education, 501-682-4342 for licensure information.

Admission Process for Initial Licensure:

Stage I: Enrolling in an Undergraduate Degree Program Leading to a Potential Teacher Licensure Field. Potential fields include the following:

- Art Education — B.F.A.
- Career and Technical Education — B.S.E.
- Elementary Education — B.S.E.
- Human Environmental Sciences Education — B.S.H.E.S.

- Kinesiology P-12 — B.S.E.
- Middle Level Education — B.S.E.
- Music Education — B.M.
- Secondary Education — B.A., B.S.

Stage II: Complete an Evaluation for Internship by October 1 prior to entering the M.A.T. Art and music students should complete the evaluation by October 1 prior to a fall internship and March 1 prior to a spring internship. Satisfactory completion of this form does not guarantee admission to the M.A.T. degree program or other teacher education programs. This form can be downloaded from the College of Education and Health Professions Web site. The form must be completed and returned to the Coordinator of Teacher Education, G-22 Stone House South. All requirements must be met to be cleared for the internship.

Students must meet the following criteria to be cleared for internship:

1. Successful completion of the PRAXIS I test by meeting or exceeding the Arkansas Department of Education cut-off scores. This test should be taken after the student has completed 30 credit hours and upon completion of ENGL 1013, ENGL 1023, and MATH 1203. Please note that several departments have additional program requirements regarding the Praxis I and II. Please consult with your adviser for additional requirements.
2. Obtain a “C” or better in the following pre-education core courses: CIED 1013, CIED 3023 (PHED 3903 for KINS K-12 majors) and CIED 3033. For Elementary Education a minimum of “C” or higher must be earned in ENGL 1013, ENGL 1023, ENGL 2003, COMM 1313, and MATH 1203 unless University of Arkansas exemption is earned in one or more of the courses.
3. Complete additional licensure requirements. COEHP majors take PBHL 1103 and PEAC 1621. PHED majors take PBHL 1103 and PHED 3043. ELED majors take HIST 3383. SEED Social Studies students take either HIST 4583 or HIST 3383 and any ECON course.
4. Secondary Education majors except for Art and Music majors, must complete the following courses with a grade of “C” or higher: CIED 3023 or CIED 4023 and CIED 4131, or present demonstration of computer competencies in a portfolio.
5. Obtain a “C” or better in the six hours of program-specific courses. (See your adviser for information.)
6. Schedule a visit with your adviser for additional requirements including admission to upper-division courses.
7. The student should consult with his/her adviser regarding PRAXIS II requirements.
8. Earn a cumulative GPA of 2.70 or higher in the undergraduate degree program (special conditional admission will be considered on a case-by-case basis for students with a GPA between 2.5 and 2.69). Some programs require a higher GPA. Consult your adviser for the GPA requirements for your program.

Stage III: Admission to M.A.T. Degree Program

Please consult with your faculty adviser for additional requirements set by your program. The following minimum criteria are necessary to be eligible for consideration for admission:

1. Meet all requirements in Stages I & II.
2. Complete an appropriate undergraduate degree program.
3. Earn a cumulative GPA of 2.70 or higher in all previous courses completed as part of a bachelor’s degree program. Some programs

require a higher GPA. Consult your adviser for the GPA requirements for your program.

4. Obtain recommendation for admission from M.A.T. program area based on successful completion of portfolios, evaluation for internship, GPA requirements, course work requirements, selected written recommendations, an interview, and other requirements specified by your program.
5. Obtain admission to the Graduate School.

Enrollment in each cohort will be limited. Transfer students will be allowed to enter the program on a space-available basis and must progress through all three admission stages.

Stage IV: Graduation requirements for the Master of Arts in Teaching (M.A.T.)

1. Meet all requirements in Stages I — III.
2. Earn a minimum cumulative GPA of 3.00.
3. Complete a minimum of 33 graduate semester hours as specified by program area.
4. Satisfactorily complete an internship. The internship will be completed at a school/district in Benton or Washington counties that has been approved by the Northwest Arkansas Partnership Steering Committee.
5. Pass the appropriate Praxis test (see adviser for the appropriate test) by meeting or exceeding the Arkansas Department of Education cut-off scores. The test is required for most programs. Please consult with your adviser.
6. Successfully complete the comprehensive examination.
7. Consult with your adviser for other requirements.
8. Apply for degree at the Graduate School, 119 Gearhart Hall.

Licensure: Students who have completed Stages I — III must obtain a licensure packet from the Coordinator of Teacher Education, Peabody Hall room 117, prior to entering internship.

Students should always consult the Coordinator of Teacher Education for licensure requirement changes. Students will not be licensed to teach in Arkansas until they have met all requirements for licensure as set forth by the Arkansas Department of Education.

Students who have completed the B.M. or B.F.A. in music or art education and have completed the internship may obtain the licensure packet from the Coordinator of Teacher Education, Peabody Hall room 117.

Usually licensure in another state is facilitated by qualifying for a license in Arkansas. An application in another state must be made on the application form of that state, which can be obtained by request from the State Teacher Licensure office in the capital city. An official transcript should accompany the application. In many instances the applications are referred to the Coordinator of Teacher Education to verify program completion in teacher education.

Master of Athletic Training

See the Master of Athletic Training program (p. 39).

Master of Business Administration

See the Business Administration program (p. 380).

Master of Education

Programs of advanced study leading to the degree of Master of Education (M.Ed.) are offered in adult and lifelong learning, educational leadership,

educational technology, elementary education, higher education, physical education, recreation and sport management, secondary education, special education, and human resource and workforce development education.

Program Requirements: General minimum requirements for the degree of Master of Education (M.Ed.) follow:

1. 27 semester hours and a thesis or 33 semester hours and no thesis.
2. A written comprehensive examination (portfolio in educational technology)
3. A cumulative grade-point average of 3.00.
4. A minimum of 24 graded UA course hours.

Admission Requirements: After a student has been admitted to the Graduate School, the student may seek acceptance into one of the M.Ed. programs. Upon acceptance to a program area, the student is assigned an adviser. Acceptance in a program should be accomplished before the completion of the first graduate course. Some programs require students to take the Graduate Record Examinations, the Miller Analogies Test, or the National Teachers Examination. All Master of Education degree programs include a minimum of 33 semester hours.

Admission to Candidacy. Admission to candidacy will be met when the following have been completed:

1. unconditionally admitted to graduate standing.
2. accepted to a program and assigned an adviser.
3. completion of 12 semester hours of graduate credit over and above any entrance deficiencies or conditions.

Transfer of Credit. Transfer of credit regulations established by the Graduate School for the Master of Arts and Master of Science degree apply to the Master of Education degree. See the Master of Arts/Master of Science section above for more information.

Residence Requirements. The candidate must present a minimum of 24 graded course hours taken in residence at the University of Arkansas, Fayetteville. Acceptance of transferred credit does not reduce the minimum residence requirement of 24 course hours taken on the University of Arkansas, Fayetteville, campus or through approved University of Arkansas, Fayetteville, distance courses.

All requirements for a master's degree must be satisfied within six consecutive calendar years.

Other Requirements. Students who do not have a grade-point average of 3.00 upon completion of Master of Education program requirements may be allowed to submit up to six additional hours of graduate credit in residence on the Fayetteville campus or at approved Graduate Resident Centers to accumulate a 3.00 average. Students should also be aware that they may not use for degree credit any course in which they received a grade of D or F.

The policies and procedures approved for the Master of Arts and Master of Science degrees also apply to the Master of Education degree. In addition to completing other requirements, the candidate must pass a comprehensive examination administered by the respective program area (portfolio for educational technology).

Master of Fine Arts

See the Art (p. 33), Creative Writing (p. 95) and Theatre (p. 324) programs.

Master of Information Systems

See the Information Systems program (p. 392).

Master of Music

See the Music program (p. 226).

Master of Public Administration

See the Public Administration program (p. 278).

Master of Science in Computer Science

See the Computer Science program (p. 84).

Master of Science in Nursing

See the Nursing program (p. 238).

Master of Social Work

See the Master of Social Work page (p. 299).

Specialist Degrees

Programs of advanced study leading to the degree of Educational Specialist (Ed.S.) are offered in curriculum and instruction and educational leadership, and may be issued by the Graduate School to those students whose major objective is to develop educational competency in one of these specialized areas. All graduate courses applicable to this degree must be taken on the Fayetteville campus unless otherwise specified.

Admission to the Program. Students who wish to become candidates for the degree of Educational Specialist are expected to first complete work equivalent to the requirements for the master's degree as determined by program faculty and must apply to be admitted to the Graduate School and the specific program of study. A student cannot satisfy any part of the residence requirement for the educational specialist degree until after he/she has been officially admitted to the educational specialist program.

Program Requirements. All Ed.S. programs contain a minimum of 30 semester hours of graduate work beyond the master's degree in a planned program. The program for each student must include the requirements specified in the particular program to which the student has been accepted; assessed deficiencies in the area of specialization; assessed courses to meet current professional requirements of the Master of Education degree; a minimum of nine semester hours of graduate work in a related field(s) other than the area of specialization; a graduate course in research, statistics, or data processing applicable for educational specialists; and an original project, research paper, or report for which variable credit up to six semester hours is required. A grade-point average of 3.25 is required for the Educational Specialist degree program on all work presented as part of the Ed.S. degree program.

After a student is accepted into an Ed.S. program, a committee with a minimum of three members will be appointed, and a program of study will be established outlining the minimum requirements. Only the adviser and one other member of the student's committee may be from the program area sponsoring the program. The committee's responsibilities include the determination of deficiencies, the acceptability of previous graduate work, the approval of the candidate's program of study, the approval of the original project or research paper, and the conduct of a final examination. This examination will be a comprehensive oral evaluation scheduled near the end of the candidate's program and will include one or both of the following: 1) evaluation of the original project, research paper, or report, and 2) evaluation covering material related to the background and professional preparation of the candidate. A written examination may not

be taken to substitute for the oral examination. A written account of the original project, research paper, or report will be filed with the program area sponsoring the candidate's program of study.

Residence Requirements: The last 30 hours of the program must be completed within a period of six years from the first semester of admission to the program. A minimum of 30 hours of resident study at the University of Arkansas, Fayetteville, in an approved program is required. Credit earned in any University of Arkansas center, off-campus workshop or special course will not count as residence study in the Ed.S. program. The only exception is course work completed at the University of Arkansas at Pine Bluff Graduate Resident Center, the University of Arkansas Community College at Hope Graduate Resident Center and Phillips Community College of the University of Arkansas at Helena Graduate Resident Center by students pursuing the Ed.S. degree in education with a specialization in educational leadership.

Upon completion of all requirements, candidates are issued an Educational Specialist degree. Their names appear on the commencement program, but there is no distinctive academic regalia in connection with the Educational Specialist degree.

Ph.D. and Ed.D. Degrees

Programs of advanced study leading to the degree of Doctor of Philosophy (Ph.D.) are offered in: animal science, anthropology, biology, business administration, cell and molecular biology, chemistry, community health promotion, comparative literature and cultural studies, computer science, counselor education, crop, soil, and environmental sciences, curriculum & instruction, economics, engineering, education policy, educational statistics and research methods, English, entomology, environmental dynamics, food science, geosciences, history, kinesiology, mathematics, microelectronics-photonics, philosophy, physics, plant science, poultry science, psychology, public policy, rehabilitation, and space and planetary sciences. (Note: For the Ph.D. in Business Administration and Economics, see the Graduate School of Business.)

Programs of advanced study leading to the degree of Doctor of Education (Ed.D.) are offered in educational leadership, higher education, recreation and sport management, and human resource and workforce development education.

The degrees of Doctor of Philosophy and Doctor of Education are awarded in recognition of high scholarly attainment as evidenced by a period of successful advanced study with at least a 3.0 cumulative graduate grade-point average, the satisfactory completion of certain prescribed examinations, a minimum number of degree credits as specified by the Arkansas Department of Higher Education, and the development of a dissertation covering some significant aspect of a major field of learning.

Students who wish to become candidates for the degree of Doctor of Philosophy or Doctor of Education are expected to complete work equivalent to the requirements for the master's degree as determined by program faculty and must apply to be admitted to the Graduate School and the specific program of study.

The University of Arkansas does not recognize any official designation such as 'ABD' or 'Ph.D. candidate' or 'Ph.D. (c),' and it is expected that if the student uses Ph.D. or Ed.D. after his/her name, it is only after the degree has been conferred. To do otherwise will be considered academic fraud.

Immediately after admission to the program, with the approval of the Dean of the Graduate School, a Doctoral Program Advisory Committee

will be appointed from the graduate faculty to evaluate the student's preparation and fitness for further graduate work. This committee will serve in an advisory capacity in working out and directing a suitable program of advanced study and investigation. The student's major adviser shall serve as chair of the committee. Appointment of this committee does not constitute admission to candidacy for the degree of Doctor of Philosophy or Doctor of Education, a very important and significant step in the student's graduate career, which must be taken after the student has completed approximately two years of graduate work beyond the baccalaureate degree.

The degree must be completed within seven consecutive calendar years from the first semester of admission to the program.

Program of Study. The objectives of the program of study leading to the degree of Doctor of Philosophy or Doctor of Education shall be scholarly achievement of high order and the development of a fundamental understanding of the major field and its relation to supporting fields of knowledge. The nature of the program of study will vary somewhat, depending upon the major field of study and the objective of the prospective candidate, but will consist of a minimum of 72 graduate semester credit hours beyond the bachelor's degree and 42 graduate-only semester hours beyond the master's degree. Program requirements must balance credit hours for required coursework, research, and dissertation preparation. In addition, a minimum of 50% of the first 30 credit hours and at least 42 of the final credit hours presented for the doctoral degree must be at the 5000 level or above. No more than 50% of the credits presented for the degree may be online unless the program has been approved for online delivery.

Ex Officio Committee Members: Student committees may contain *ex officio* members who have graduate faculty status on the University of Arkansas campus. However, when a person does not hold graduate faculty status on the University of Arkansas campus, he/she may still be allowed to hold an *ex officio* position on a student's committee, in accordance with the following policy:

When a committee member does not hold graduate faculty status at the University of Arkansas, he/she will be allowed to serve on a student's master's thesis or doctoral dissertation committee, in addition to the minimum number of members required by the Graduate School or the department/program. The *ex officio* member will be allowed to sign the thesis or dissertation and his/her vote will be recorded but will not be binding for conferring the degree. This use of the term *ex officio* will indicate that the person does not hold graduate faculty status at the University of Arkansas and is serving in an honorary role.

Conflict of Interest Policies : Students should be aware that the Graduate School has policies pertaining to the composition of advisory and dissertation committees. These may be found in the Graduate Student Handbook on the Graduate School website. It should also be noted that to avoid the perception of a conflict of interest, students are discouraged from providing refreshments and faculty are discouraged from creating the expectation that students will provide refreshments during oral defenses.

Transfer of Credit Regulations Established by the Graduate School for Doctoral Degrees: Transfer credit is allowed to fulfill the course requirements of the doctoral degree at the discretion and request of the department/program. All dissertation hours and the candidacy exam must be taken at the University of Arkansas, Fayetteville. If sufficient hours have been earned at the University of Arkansas to meet the requirements

of the degree, additional hours will not be transferred. Transfer of course work is done at the end of the student's program.

Criteria for Acceptable Transfer Credit:

1. Only graded courses (not research hours) are subject to transfer.
2. The course must have been regularly offered (not special problems or individual study) by a regionally accredited graduate school.
3. The course must have been a bona fide graduate level course, approved for graduate credit and taught by a member of the graduate faculty.
4. The course must appear on an official transcript as graduate credit from the institution offering the course.
5. The course grade must be a "B" or "A." (The student's grade-point average is NOT to include grades on transfer courses.)
6. The course must be recommended by the student's major adviser and be applicable to the degree requirement at the University of Arkansas.
7. The course must not have been taken by correspondence or for extension credit. Course cannot be a self-paced course.
8. The course must be acceptable to the department/program concerned (with the appropriate signature by the department/program chair/head/director) and to the Graduate Dean.
9. The course must have been taken within the seven-year time limit of the student's program at the University of Arkansas.
10. The transcript must say either that the student was admitted to a doctoral program, the course work was completed after an earned master's degree, or a master's degree was not earned while the student was attending the institution.

Petition for the transfer of credit from foreign universities may be made to the Graduate Dean by the department/program.

Graduate credit cannot be transferred to satisfy any of the requirements for degrees unless they are from appropriately accredited schools.

Grades. All courses included in a student's program of study for a degree must have an acceptable grade (a letter grade of A, B, or C) or a mark of CR. A mark of 'S' does not carry degree credit and any course with a mark of 'S' cannot be included in the final program of study. If the course is to be included in a program of study, the mark of 'S' must be changed to an acceptable grade or a mark of CR, although no more than six hours of CR may be accepted toward the requirements for a graduate degree. Please note that all work for the course must have been submitted by the student to the instructor by the last day of final examinations in order to be eligible for graduation for that specific semester.

Grade-Point Average Requirement. A minimum cumulative graduate grade-point average of 3.0 is required to earn a Doctor of Philosophy or Doctor of Education degree. Note: For students admitted to the Graduate School prior to Fall 2001, the minimum cumulative graduate grade-point average required to earn a Doctor of Philosophy or Doctor of Education degree was 2.85. Students should also be aware that they may not present for degree credit any course in which they earned a grade of D or F.

Language Requirement. Foreign language requirements for the Doctor of Philosophy degree vary from department to department. For specific details see departmental statements. These requirements should be completed early in the doctoral program. The Doctor of Education degree does not have a foreign language requirement.

Examination for Candidacy. After completing approximately two years of graduate study, the prospective candidate must take candidacy examinations in specified fields of study in accordance with the requirements of the program/department in which the candidate is working. These examinations may be either written or written and oral, but the expectation is that their purpose is to determine if a student is prepared to move to the independent research stage of his/her degree.

Upon satisfactorily completing these examinations, the student may be admitted to candidacy and may proceed to work toward completion of the remaining requirements for the degree. The Graduate School should be notified within two weeks of the student being admitted to candidacy. Note: The Graduate School considers the Advisory Committee to be responsible for administering and evaluating the candidacy examinations, but degree programs may have different structures.

Registration. All doctoral students who have been admitted to candidacy must enroll in a minimum of one hour of graduate course work or dissertation credit every major semester (fall, spring) until they graduate. Under unusual circumstances, this enrollment requirement may be waived for post-candidacy doctoral students for up to two years, with an approved request for a leave of absence. See the Graduate School Registration Policy (p. 424). Note: doctoral students must also be enrolled in a minimum of one hour of graduate credit in the semester that they graduate. Students who fail to enroll each major semester after candidacy will have additional hours of dissertation credit added to the final semester of enrollment; this will be above the 18 hours of dissertation credit required for the degree.

Dissertation. Each candidate must complete a doctoral dissertation on some topic in the major field. The topic assignment shall be made and a title filed with the Dean of the Graduate School at least one year before the final examination, the specific problem and subject of the dissertation to be determined by the major adviser, the candidate, and the advisory committee. The completed dissertation must be a definite, scholarly contribution to the major field. This contribution may be in the form of new knowledge of fundamental importance, or of modification, amplification, and interpretation of existing significant knowledge. We expect the dissertation to be written in English. Under exceptional circumstances, another language may be used if prior approval is obtained from the Dean of the Graduate School. A request to write in a language other than English should be submitted to the Dean of the Graduate School by the student's dissertation committee, with endorsement by the department/program head/chair/director, prior to admission to candidacy for the degree sought. The request should include a proposal and justification for the exception. In all cases, one dissertation abstract must be written in English and the defense of the dissertation must be in English. Programs wishing to be eligible for their students to submit dissertations in languages other than English shall seek approval in advance from the Graduate Council.

Each doctoral candidate must register for a minimum of 18 hours of doctoral dissertation. After the student has passed the candidacy examinations, the student must register for at least one hour of dissertation (or graded course work) each major semester and during the semester of graduation, whether the student is in residence or away from the campus. Before the final degree is conferred, registration will be assessed for each semester in which a student fails to register without prior approval of the Dean of the Graduate School.

The dissertation must be submitted for approval to the dissertation committee consisting of a minimum of three faculty members who have been approved by the Dean of the Graduate School. This committee must receive the dissertation in time for the student to defend the dissertation

and submit it to the Graduate School by the posted deadline date. Students will be required to provide documentation that they did the majority of the work for each paper submitted under the published paper option where the papers have co-authors. For instructions on submitting an approved dissertation, students should consult the Graduate School's *Guide to Preparing Theses and Dissertations*. Students will be required to submit their dissertations to University Microfilms Incorporated (UMI/ProQuest).

The Use of Copy Editors in Dissertations. The Graduate School at the University of Arkansas does not forbid the use of copy editors (see definition below) for theses and dissertations under the following conditions:

1. Any use of copy editors for theses and dissertations must be approved by the thesis/dissertation committee and the department/program chair/head/director.
2. The student understands that there is a difference between legitimate editing and violations of academic integrity policies and is responsible for ensuring that the line is not crossed.

*Note: The Graduate School considers it to be a violation of our academic integrity policy to use copy editors in any Graduate School required exam (e.g. comprehensive exam, candidacy exam).

Definition of copy editors: copy editors review written material for accuracy, readability, coherence and relevance as well as for errors of spelling and grammar. This policy refers to the provision of such services regardless of by whom they are provided and regardless of whether the copy editor is paid or unpaid. (Members of the thesis/dissertation committee are exempt from this definition.)

Final Examination. The candidate's final examination for the degree of Doctor of Philosophy or Doctor of Education will be oral. At least two weeks in advance, the major adviser will forward to the Dean of the Graduate School notification about the date, time and place of the final oral examination. The examination will be primarily concerned with the field of the dissertation, but may also include other aspects of the candidate's graduate work. The doctoral dissertation committee is responsible for insuring that the dissertation contributes new knowledge of fundamental importance or significantly modifies, amplifies, or interprets existing knowledge in a new and important manner. All members of the dissertation committee must participate in the final oral defense of the dissertation unless the Dean of the Graduate School has approved an exception. This participation may be by distance. If they do not participate in the final oral defense, in person or by distance, they will be asked by the Graduate School to resign from the committee. While this examination is open to the public, the exam is controlled by the student's committee chair. Questions from the public are at the discretion of the committee chair. If the committee chair expects to allow questions from the public, the student must be so advised. The chair will insure that questions from the public are appropriate by disallowing those which are not.

Students may elect to participate by distance through electronic means in their final oral defense of the dissertation, if approved by the dissertation faculty director. In advance of the final oral defense, the student must provide to the Graduate School a written, signed statement that he/she has elected this option.

Split Decisions Within Advisory and Dissertation Committees. In the situation when there is a split decision among committee members of a doctoral program advisory or dissertation committee, the situation must be resolved to the satisfaction of each committee member. In the event

that each committee member is not satisfied, the committee member may insist on the necessary steps to reach a resolution or elect to step down from the committee. In unusual circumstances, the Dean of the Graduate School may remove a faculty member from a student's thesis/dissertation or advisory committee, or make an alternative arrangement (e.g., assign a representative from the Graduate faculty to serve on the committee).

Professional Doctoral Degrees

Currently, the University of Arkansas offers two professional doctoral degrees:

- Doctor of Nursing Practice (D.N.P.)
- Doctor of Occupational Therapy (O.T.D.)

The degree of Doctor of Nursing Practice is conferred for advanced professional proficiency in the area of nursing advanced nursing practice.

The degree of Doctor of Occupational Therapy is conferred for entry-level professional proficiency in the area of clinical occupational therapy.

The degrees of Doctor of Nursing Practice and Doctor of Occupational Therapy are awarded in recognition of high scholarly attainment and the fulfillment of expectations set by the respective professional and accrediting organizations. In each case, there will be ethical standards set in addition to the curriculum requirements.

Students who wish to become candidates for the degree of Doctor of Nursing Practice or Doctor of Occupational Therapy must apply to be admitted to the Graduate School and the specific program of study.

Doctor of Nursing Practice: After admission, an adviser will be assigned to guide the student's plan of study, and a Doctoral Program Advisory Committee will be appointed from the graduate faculty to guide the development of the D.N.P. Project, the culminating experience in which students engage in practice scholarship. Refer to the Eleanor Mann School of Nursing Graduate Student Handbook for specific requirements.

Doctor of Occupational Therapy: The doctoral capstone provides an in-depth exposure to one or more of the following: clinical practice skills, research skills, administration, leadership, program and policy development, advocacy, education, and theory development. The doctoral capstone consists of two parts, a Capstone project and a Capstone experience. During the second year in the O.T.D. program (of three), a Doctoral Capstone Advisory Committee will be appointed from the graduate faculty to guide the development of the O.T.D. Capstone Project. Refer to the O.T.D. Handbook for specific requirements.

Ex Officio Committee Members. Student committees may contain *ex officio* members who have graduate faculty status on the University of Arkansas campus. However, when a person does not hold graduate faculty status on the University of Arkansas campus, the faculty member may still be allowed to hold an *ex officio* position on a student's committee, in accordance with the following policy:

When a committee member does not hold graduate faculty status at the University of Arkansas, he or she will be allowed to serve on a student's advisory or project/capstone committee, in addition to the minimum number of members required by the department or program. The *ex officio* member's vote will be recorded but will not be binding for the degree. This use of the term *ex officio* will indicate that the person does not hold graduate faculty status at the University of Arkansas and is serving in an honorary role.

Conflict of Interest Policies. Students should be aware that the Graduate School has policies pertaining to the composition of advisory and project/capstone committees. These may be found in the Graduate Student Handbook on the Graduate School website. It should also be noted that to avoid the perception of a conflict of interest, students are discouraged from providing refreshments and faculty are discouraged from creating the expectation that students will provide refreshments during oral defenses.

Online Credits. No more than 50% of the credits presented for the degree may be online unless the program has been approved for online delivery.

Grades. All courses included in a student's program of study for a degree must have an acceptable grade (a letter grade of A, B, or C) or a mark of CR. A mark of 'S' does not carry degree credit and any course with a mark of 'S' cannot be included in the final program of study. If the course is to be included in a program of study, the mark of 'S' must be changed to an acceptable grade or a mark of CR. Please note that all work for the course must have been submitted by the student to the instructor by the last day of final examinations in order to be eligible for graduation for that specific semester.

Grade-Point Average Requirement. A minimum cumulative graduate grade-point average of 3.0 is required to earn a Doctor of Nursing Practice or Doctoral of Occupational Therapy degree. Students should also be aware that they may not present for degree credit any course in which they earned a grade of D or F.

Split Decisions Within Advisory and Project/Capstone Committees. In the situation when there is a split decision among committee members of a doctoral program advisory or project/capstone committee, the situation must be resolved to the satisfaction of each committee member. In the event that each committee member is not satisfied, the committee member may insist on the necessary steps to reach a resolution or elect to step down from the committee. In unusual circumstances, the Dean of the Graduate School may remove a faculty member from a student's project/capstone or advisory committee, or make an alternative arrangement (e.g., assign a representative from the graduate faculty to serve on the committee).

Service Learning

Jennie Popp
Co-Chair of Initiative
Honors College
249 Gearhart Hall
479-575-7381
jhpop@uark.edu

Angela Oxford
Co-Chair of Initiative
Center for Community Engagement
A643 Arkansas Union
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Email: svclm01@uark.edu

The Service Learning Initiative

The Service Learning Initiative is a joint initiative between the University of Arkansas Provost Office, the Honors College, and the Division of Student

Affairs. Service learning builds critical thinking skills while engaging in academic courses that promote experiential, community-based activities. Formulated service learning courses must meet the committee-approved service learning definition and criteria, and be approved for designation by the Service Learning Committee.

Service Learning Definition

Service learning is a credit-bearing, faculty-directed, teaching-learning experience that is course specific. Service Learning strengthens academic content knowledge and sense of civic responsibility. Students build critical thinking skills as they engage in experiential, community-based activities that are aligned with and integral to academic course work. At the same time, the community (real people in real situations) benefits from assistance that would otherwise not be available.

Courses Page

Students can visit the Service Learning program course page (<https://servicelearning.uark.edu/courses/>) to find courses that have been designated with service-learning components. Faculty can find criteria (<http://servicelearning.uark.edu/>) to develop courses that will be considered for designation as service learning courses.

Service Learning Steering Committee

- Alison Turner, Fay Jones School of Architecture and Design
- Casey Kayser, Fulbright College of Arts and Sciences
- Fran Hagstrom, College of Education and Health Professions
- Sarah Hernandez, College of Engineering
- Lisa Wood, Dale Bumpers College of Agricultural, Food and Life Sciences
- Molly Jensen, Department of Marketing, Sam M. Walton College of Business
- Veronica Mobley, Office of Study Abroad
- Chelsea Hodge and Katie Wilson, Honors College
- Angela M. Doss, School of Law
- Lora Lennertz, University Libraries
- Lori Holyfield and Jack Kern, Teaching and Faculty Support Center

Graduate Council

Kim Needy, Dean of the Graduate School and International Education; Professor, Industrial Engineering

Patricia R. Koski, Associate Dean of the Graduate School and International Education; Associate Professor, Sociology and Criminal Justice; Chair (*Ex-officio*)

Vikas Anand, Associate Professor, Management

Mindy S. Bradley, Associate Professor, Sociology and Criminal Justice

Kathleen Collins, Professor, Curriculum and Instruction

T. Paul Cronan, Professor, Information Systems

Andrew J. Dowdle, Professor, Political Science

Judy Ganson, Associate Librarian, University Libraries

Valerie H. Hunt, Associate Professor, Political Science and Public Policy

Terry Martin, Associate Dean of the College of Engineering; Professor, Electrical Engineering

Michael T. Miller, Associate Dean of the College of Education and Health Professions (*Ex-officio*); Professor, Human Resources

Anne O'Leary-Kelly, Associate Dean of the Walton College of Business (*Ex-officio*); Professor, Management

Lona J. Robertson, Associate Dean, Bumpers College of Agricultural, Food and Life Sciences, Professor, Human Environmental Sciences

Melissa Harwood-Rom, Senior Associate Dean of Students (*Ex-officio*)

Yvette Murphy-Erby, Associate Dean of the Fulbright College of Arts and Sciences (*Ex-officio*); Professor, Social Work

Thad Scott, Assistant Professor, Crop, Soil and Environmental Sciences

R. Panneer Selvam, Professor, Civil Engineering

Fred Spiegel, Professor, Biological Sciences

Jacquelyn D. Wiersma, Assistant Professor, Human Environmental Sciences

Two representatives from the Graduate Dean's Student Advisory Board

Accreditations

The University of Arkansas, Fayetteville, is accredited by the Higher Learning Commission.

Some colleges and programs are also accredited by other agencies, associations, or professional organizations, including those listed below.

Dale Bumpers College of Agricultural, Food and Life Sciences

The Jean Tyson Child Development Study Center is accredited by the National Association for the Education of Young Children (NAEYC). Teacher education programs in agriculture and family and consumer sciences are coordinated with educational programs in the College of Education and Health Professions and are accredited by the National Council for Accreditation of Teacher Education (NCATE).

Fulbright College of Arts and Sciences

The Master of Music (M.M.) degree program at the University of Arkansas is accredited by the National Association of Schools of Music. The Doctor of Philosophy (Ph.D.) degree program in clinical psychology is accredited by the American Psychological Association. The Master of Social Work (M.S.W.) degree program is accredited by the Council of Social Work Education.

Sam M. Walton College of Business

The Sam M. Walton College of Business offers degree programs for graduate students at both the master's and doctoral levels and has been a member of and accredited by AACSB International, the Association to Advance Collegiate Schools of Business, since 1931. The accounting program was separately accredited in 1986 at both the bachelor's and master's levels. The master's in business administration program was approved in 1963. Accreditation by AACSB and membership in that organization signifies the college's commitment to AACSB goals of promoting and achieving the highest standards of business education.

College of Education and Health Professions

The teacher education programs in the College of Education and Health Professions are accredited by the National Council for Accreditation of Teacher Education. The M.A.T. program in childhood education is in compliance with the standards of the National Association for the Education of Young Children. The various M.A.T. licensure programs in secondary education are in compliance with the standards of the specialty organizations including National Council of Teachers of English, National Council of Teachers of Mathematics, National Science Teachers Association, and National Council for the Social Studies. The Master of Science degree program in speech pathology-audiology is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association. The Master of Science degree in rehabilitation counseling is accredited by the Council on Rehabilitation Education.

College of Engineering

The College of Engineering offers the following graduate programs accredited by the Engineering Accreditation Commission of ABET (visit <http://www.abet.org> for more information): Master of Science in Environmental Engineering (M.S.En.E.), and Master of Science in Biomedical Engineering (M.S.B.M.E.)

School of Law

The degree programs in the School of Law on the Fayetteville campus are accredited by both the American Bar Association and the Association of American Law Schools.

Graduate Faculty

Graduate faculty are listed in alphabetical order.

A

Abrahams, Daniel, Ph.D. (Oakland University), M.M. (University of Nebraska at Omaha), B.M.E. (Temple University), Assistant Professor, Department of Music, 2016.

Ackerson, Michael D., Ph.D. (University of Arkansas), M.S.Ch.E., B.S.Ch.E. (University of Missouri-Rolla), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 1986.

Acrey, Cash, Ph.D., M.B.A. (University of Arkansas), B.A. (University of Arkansas at Little Rock), Clinical Assistant Professor, Department of Finance, 2013.

Adam, Thomas, Ph.D., M.A. (University of Leipzig), Associate Professor, Department of Political Science, 2020.

Adams, Douglas James, Ph.D., M.A. (University of Arizona), Associate Professor, Department of Sociology and Criminology, 1995.

Adams, Justin J., Ph.D. (University of South Carolina), M.Ed., B.A. (Winthrop University), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2018.

Adams, Paul D., Ph.D. (Case Western Reserve University), B.S. (Louisiana State University), Associate Professor, Department of Chemistry and Biochemistry, 2006.

Adler, Jacob, Ph.D., A.B. (Harvard University), Associate Professor, Department of Philosophy, 1984.

Agana, Carol E., M.N.Sc. (University of Arkansas for Medical Sciences), B.S.E. (University of Arkansas), Instructor, Eleanor Mann School of Nursing, 1998.

Ahrendsen, Bruce L., Ph.D., M.S. (North Carolina State University), B.S. (Iowa State University), Professor, Department of Agricultural Economics and Agribusiness, 1990.

Akeroyd, John R., Ph.D., M.A. (Indiana University at Bloomington), B.A. (University of Louisville), Professor, Department of Mathematical Sciences, 1986.

Al Faouri, Radwan A., Ph.D. (University of Arkansas), Research Assistant Professor, Nanotechnology, 2015.

Allee, Kristian, Ph.D., M.B.A. (Indiana University), B.S. (Brigham Young University), Associate Professor, Department of Accounting, 2016.

Allen, Bradley, Ph.D. (University of Texas at San Antonio), B.S. (Brigham Young University), Assistant Professor, Department of Marketing, 2017.

Allen, Jeremy L., D.M.A. (Cleveland Institute of Music), M.M. (University of Kentucky), B.S. (John Brown University), Lecturer, Department of Music, 2018.

Allen, Myria, Ph.D., M.A., B.A. (University of Kentucky), Professor, Department of Communication, 1993.

Allison, Kayla, M.A. (University of Arkansas), B.A. (Indiana University-Bloomington), Instructor, Department of Sociology and Criminology, 2020.

Allison, Neil T., Ph.D. (University of Florida), B.S. (Georgia College), Associate Professor, Department of Chemistry and Biochemistry, 1980.

Almenara, Erika, Ph.D. (University of Michigan), M.A. (University of Wisconsin-Milwaukee), B.A. (Feminine University of the Sacred Heart), Assistant Professor, Department of World Languages, Literatures and Cultures, 2015.

Almodovar Montanez, Jorge L., Ph.D. (Colorado State University), Assistant Professor, Ralph E. Martin Department of Chemical Engineering, 2018.

Aloia, Lindsey S., Ph.D. (Pennsylvania State University), M.A. (University of Delaware), B.A. (College of New Jersey), Associate Professor, Department of Communication, 2017.

Aloysius, John, Ph.D. (Temple University), B.S. (University of Colombo, Sri Lanka), Professor, Department of Supply Chain Management, 1995.

Alrubaye, Adnan A., Ph.D., M.Ed. (University of Arkansas), M.Sc. (University of Baghdad), Research Assistant Professor, Department of Poultry Science, Department of Biological Sciences, 2013.

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- ## B
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Gethers, Katchia, Ed.D. (John Hopkins University), Lecturer, Department of Curriculum and Instruction, 2019.

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Gibson, Kristen Elizabeth, Ph.D. (Johns Hopkins University), B.S. (University of Central Florida), Associate Professor, Department of Food Science, 2012.

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Gigantino, Jim, Ph.D. (University of Georgia), B.A. (University of Richmond), Professor, Department of History, 2010.

Gilbertson, Margie, Ph.D. (University of Memphis), M.S.E., B.A. (University of Central Arkansas), Clinical Instructor, Department of Rehabilitation, Human Resource and Communication Disorders, 2016.

Glade, Rachel E., Ph.D. (University of Arkansas), M.S. (University of Arkansas for Medical Sciences), M.A. (University of Arkansas), B.S. (University of Arkansas at Little Rock), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2015.

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Gosman, Sara, J.D., M.P.A. (Harvard University), A.B. (Princeton University), Assistant Professor, School of Law, 2014.

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Greenhaw, William Karl, J.D. (University of Arkansas), B.A. (Westminster College), Instructor, Department of Accounting, 2001.

Greenlee, Lauren F., Ph.D., M.S. (University of Texas, Austin), BSChE (University of Michigan), Associate Professor, Ralph E. Martin Department of Chemical Engineering, 2015.

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Gruenwald, Jeffrey A., Ph.D. (Michigan State University), Associate Professor, Department of Sociology and Criminology, 2019.

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- Hintz, Rashauna**, M.A., B.A. (University of Arkansas), Instructor, Department of Geosciences, 2011.
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- Hofer, Christian**, Ph.D. (University of Maryland University College), B.A. (European School of Business), Associate Professor, Department of Supply Chain Management, 2007.
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- Holland, Beth**, Ed.D. (John Hoskins University), Lecturer, Department of Curriculum and Instruction, 2019.
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- Howie, Erin**, Ph.D. (University of South Carolina), B.S. (University of Maryland), Assistant Professor, Department of Health, Human Performance and Recreation, 2016.
- Hoyer, Jennifer M.**, Ph.D., M.A. (University of Minnesota-Twin Cities), B.A. (University of Tulsa), Associate Professor, Department of World Languages, Literatures and Cultures, 2007.
- Hsu, Hung-Chia Scott**, Ph.D. (University of North Carolina-Chapel Hill), M.A. (University of Southern California), B.A. (National Taiwan University), Assistant Professor, Department of Finance, 2015.

- Hu, Han**, Ph.D. (Drexel University), Assistant Professor, Department of Mechanical Engineering, 2019.
- Hu, Jin**, Ph.D. (Tulane University), B.S. (University of Science and Technology of China), Assistant Professor, Department of Physics, 2017.
- Huang, Miaoqing**, Ph.D. (George Washington University), B.S. (Fudan University), Associate Professor, Department of Computer Science and Computer Engineering, 2010.
- Huang, Po-Hao Adam**, Ph.D., M.S., B.S. (University of California-Los Angeles), Associate Professor, Department of Mechanical Engineering, 2006.
- Huang, Quiqiong**, Ph.D. (University of California-Davis), B.S. (Remin University of China), Professor, Department of Agricultural Economics and Agribusiness, 2013.
- Huang, Yan**, Ph.D. (University of Wyoming), M.S. (Dankook University), B.S. (China Agricultural University), Assistant Professor, Department of Animal Science, 2015.
- Hubert, Stephanie K.**, M.S. (University of Arkansas), B.S. (Kansas State University), Instructor, School of Human Environmental Sciences, 2015.
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- Johnson, Michael**, M.S.C.E. (University of Pittsburgh), B.S.C.E. (University of Minnesota), B.A. (Chapman College), Professor, Department of Civil Engineering, 2010.
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- Lane, Valerie Jean**, M.F.A. (Pennsylvania State University), B.F.A. (Memphis College of Art), Instructor, Department of Theatre, 2008.
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- Su, Danjie**, Ph.D. (University of California, Los Angeles), M.A., B.A. (Sun Yatsen University, China), Assistant Professor, Department of World Languages, Literatures and Cultures, 2017.
- Suarez, Celina A.**, Ph.D. (University of Kansas), M.S. (Temple University), B.S. (Trinity University), Associate Professor, Department of Geosciences, 2012.
- Subbiah, Jeyamkondan**, Ph.D. (Oklahoma State University), M.S. (University of Manitoba, Canada), B.E. (Tamil Nadu Agricultural University, India), Professor, Department of Food Science, 2019.
- Sui, Daniel**, Ph.D. (University of Georgia), M.S., B.S. (Peking University), Distinguished Professor, Department of Geosciences, 2018.
- Sullivan, Amanda Lynn**, Ph.D., M.A.T., B.S.E. (University of Arkansas), Clinical Associate Professor, Department of Health, Human Performance and Recreation, 2010.
- Sullivan, Kelly M.**, Ph.D. (University of Florida), M.S.I.E., B.S.I.E. (University of Arkansas), Associate Professor, Department of Industrial Engineering, 2012.
- Sun, Xiaolun**, Ph.D., M.S. (Virginia Polytechnic Institute and State University), B.S. (Southern China Agricultural University), Assistant Professor, Department of Poultry Science, 2016.
- Sutherland, Daniel E.**, Ph.D., M.A., B.A. (Wayne State University), Distinguished Professor, Department of History, 1989.
- Sutton, James M.**, M.S. (Southern Methodist University), B.S. (University of West Florida), B.M. (University of Southern Mississippi), Instructor, Operations Management Program, 2017.
- Swedenburg, Ted R.**, Ph.D., M.A., (University of Texas at Austin), B.A. (University of Beirut), Professor, Department of Anthropology, 1996.
- Sykes, Tracy Ann**, Ph.D. (University of Arkansas), B.S. (University of Maryland-College Park), Associate Professor, Department of Information Systems, 2011.
- Syler, Rhonda A.**, Ph.D. (Auburn University), M.B.A. (Columbus State University), M.S. (Kansas State University), B.S. (Middle Tennessee State University), Clinical Assistant Professor, Department of Information Systems, 2016.
- Sytsma, Janine A.**, Ph.D. (University of Wisconsin-Madison), M.A. (University of Denver), B.A. (Arizona State University), Assistant Professor, School of Art, 2016.
- Szalanski, Allen Lawrence**, Ph.D. (University of Nebraska-Lincoln), M.S. (Kansas State University), B.S. (University of Manitoba), Professor, Department of Entomology and Plant Pathology, 2001.
- Szwydky-Davis, Lissette López**, Ph.D., M.A. (Penn State University), B.A. (University of Miami), Associate Professor, Department of English, 2013.
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- Talafuse, Thomas**, Ph.D. (University of Arkansas), M.S. (Air Force Institute of Technology), B.S. (United States Air Force Academy), Instructor, Operations Management Program, 2018.
- Taoka, Loring**, M.F.A. (University of North Texas), Instructor, School of Art, 2012.
- Tarvin, Tim**, J.D. (University of Arkansas), B.A. (Hendrix College), Associate Professor, School of Law, 1993.

- Taylor, Jennifer**, Ph.D. (University of Missouri-Kansas City), M.A. (University of Northern Iowa), B.A. (University of Kentucky), Research Professor, Department of Marketing, 2014.
- Teague, Rick**, M.S. (Webster University), B.B.A. (University of Memphis), Instructor, Operations Management Program, 2001.
- Teal, Kimberly Hannon**, Ph.D., M.M. (Eastman School of Music), B.A. (University of Oregon), Assistant Professor, Department of Music, 2016.
- Tellez-Isaias, Guillermo**, Ph.D. (Texas A&M University), Visiting Professor, Department of Poultry Science, 2002.
- Ten Haaf, Rachel E.**, Ph.D. (University of Michigan), M.A. (University of Illinois, Urbana-Champaign), Assistant Professor, Department of World Languages, Literatures and Cultures, 2016.
- Terhune, Claire E.**, Ph.D., M.A. (Arizona State University), B.A., B.S. (College of Charleston), Assistant Professor, Department of Anthropology, 2013.
- Terrell, Joyce E.**, Ph.D. (University of Arkansas), Instructor, Department of Curriculum and Instruction, 2019.
- Terrell, Katie**, M.B.A. (University of Arkansas), B.A. (University of Central Arkansas), Instructor, Department of Accounting, 2012.
- Teuton, Sean Kicummah**, Ph.D., M.A. (Cornell University), B.A. (University of Colorado-Boulder), Professor, Department of English, 2013.
- Thallapuram, Suresh**, Ph.D. (Osmania University), Professor, Department of Chemistry and Biochemistry, 2003.
- Thibado, Paul M.**, Ph.D. (University of Pennsylvania), B.S. (San Diego State University), Professor, Department of Physics, 1996.
- Thoma, Greg**, Ph.D. (Louisiana State University), M.S.Ch.E., B.S.Ch.E. (University of Arkansas), Professor, Ralph E. Martin Department of Chemical Engineering, 1993.
- Thomas, JaLynn D.**, B.S. (Louisiana Tech College Ruston Campus), Instructor, Department of Accounting, 2011.
- Thomas, Johanna**, Ph.D., M.S.W. (Louisiana State University), B.A. (University of Akron), Assistant Professor, School of Social Work, 2015.
- Thomas, Lauren**, D.V.M. (Oklahoma State University), B.S. (University of Arkansas), Teaching Assistant Professor, Department of Animal Science, 2016.
- Thomas, Rodney W.**, Ph.D., M.B.A. (University of Tennessee), B.S.B.A. (Greensboro College), Associate Professor, Department of Supply Chain Management, 2017.
- Thomas, Shaun A.**, Ph.D., M.A. (Louisiana State University), B.A. (University of Akron), Associate Professor, Department of Sociology and Criminology, 2015.
- Thompson, Audie K.**, Ph.D. (University of Mississippi Medical Center), Assistant Professor, Ralph E. Martin Department of Chemical Engineering, 2018.
- Thompson, Dale R.**, Ph.D. (North Carolina State University), M.S., B.S. (Mississippi State University), Associate Professor, Department of Computer Science and Computer Engineering, 2000.
- Thompson, Randy**, J.D. (University of Illinois-Urbana-Champaign), M.L.S., B.A. (Indiana University), Associate Professor, School of Law, 2008.
- Thompson, Timothy F.**, D.M.A., M.M. (University of Wisconsin-Madison), Professor, Department of Music, 1979.
- Thomsen, Michael R.**, Ph.D. (University of Minnesota-Morris), M.S., B.S. (Utah State University), Professor, Department of Agricultural Economics and Agribusiness, 1998.
- Thrash, Ben**, , Assistant Professor, Department of Entomology and Plant Pathology, 2018.
- Thurston, Colleen**, M.F.A. (Montana State University), Assistant Professor, School of Journalism and Strategic Media, 2019.
- Tian, Ryan**, Ph.D. (University of Connecticut), B.S. (Fudan University, Shanghai), Associate Professor, Department of Chemistry and Biochemistry, 2004.
- Tipsmark, Christian K.**, Ph.D., M.S. (University of Southern Denmark), Associate Professor, Department of Biological Sciences, 2010.
- Tjani, Maria**, Ph.D. (Michigan State University), M.S. (Purdue University), B.S. (University of Ioannina, Greece), Associate Professor, Department of Mathematical Sciences, 2003.
- Tonymon, Susan**, M.S.W. (University of Arkansas at Little Rock), B.S.W. (Arkansas State University), Instructor, School of Social Work, 2014.
- Trammell, Breanne M.**, M.F.A. (Rhode Island School of Design), Assistant Professor, School of Art, 2019.
- Trivitt, Julie R.**, Ph.D., M.A. (University of Arkansas), M.A. (Southwest Missouri State University), Clinical Associate Professor, 2012.
- Troiano, Eric**, D.M.A., M.M. (Michigan State University), B.M. (Ithaca College), Instructor, Department of Music, 2016.
- Trudo, Sabrina P.**, Ph.D. (University of Washington), B.S. (Brigham Young University), Associate Professor, School of Human Environmental Sciences, 2015.
- Tullis, Jason A.**, Ph.D., M.S. (University of South Carolina at Columbia), B.S. (Brigham Young University), Professor, Department of Geosciences, 2004.
- Tumilson, Creed**, Ph.D., M.A. (University of Arkansas), B.S. (Arkansas State University), Visiting Assistant Professor, Department of Political Science, 2020.
- Tung, Steve**, Ph.D., M.S.M.E. (University of Houston), B.S.M.E. (National Taiwan University), Professor, Department of Mechanical Engineering, 2000.
- Turner, Aaron**, M.F.A. (Rutgers State University), B.A. (University of Memphis), Research Associate, School of Art, 2016.
- Turner, Ronna L.**, Ph.D. (University of Illinois-Urbana-Champaign), M.S.E. (Missouri State University), B.S.E. (Southwest Missouri State University), Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 1997.
- Tzanetakis, Ioannis E.**, Ph.D. (Oregon State University), M.S., B.S. (Agricultural University of Athens, Greece), Professor, Department of Entomology and Plant Pathology, 2008.
- ## U
- Ungar, Peter S.**, Ph.D., M.A. (State University of New York at Stony Brook), B.A. (State University of New York, Binghamton), Distinguished Professor, Department of Anthropology, 1995.
- Uribe, Lia**, D.M.A. (University of Kansas), M.M. (University of Arkansas), B.M. (Universidad Nacional de Colombia, Bogotá), Assistant Professor, Department of Music, 2013.
- ## V
- Vajda, Anthony J.**, Ph.D. (Old Dominion University), M.S. (La Salle University), B.A. (University of Delaware), Assistant Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2018.
- Valandra**, Ph.D., M.S.W. (University of Minnesota), M.B.A., B.S. (University of Nebraska at Omaha), Associate Professor, School of Social Work, 2013.
- Van Hoek, Remko**, Ph.D. (University of Utrecht), M.B.A. (London School of Economics), B.S.B.A. (Vanderbilt University), Clinical Professor, Department of Supply Chain Management, 2018.
- Van Horn-Morris, Jeremy**, Ph.D. (University of Texas at Austin), B.S. (University of Oregon), Associate Professor, Department of Mathematical Sciences, 2012.
- Vandermark, Lesley**, Ph.D., M.S. (University of Connecticut), B.S. (California University of Pennsylvania), Clinical Assistant Professor, Department of Health, Human Performance and Recreation, 2016.
- VanDevender, Karl**, Ph.D. (University of Arkansas), M.S., B.S. (Mississippi State University), Professor, Department of Biological and Agricultural Engineering, 1995.

- Vargas, Ivan**, Ph.D. (University of Michigan), B.S. (Notre Dame University), Assistant Professor, Department of Psychological Science, 2019.
- Vega, Jose L.**, Ph.D. (University of Arkansas), Instructor, Ralph E. Martin Department of Chemical Engineering, 2020.
- Veilleux, Jennifer Celene**, Ph.D., M.A. (University of Illinois at Chicago), B.A. (Macalaster College), Associate Professor, Department of Psychological Science, 2011.
- Velliquette, Anne M.**, Ph.D. (University of Arkansas), M.A.B., B.S. (Southwest Missouri State University), Clinical Assistant Professor, Department of Marketing, 2014.
- Venkatesh, Viswanath**, Ph.D. (University of Minnesota-Twin Cities), B.E. (Bharathiar University, India), Distinguished Professor, Department of Information Systems, 2004.
- Vennarucci, Rhodora**, Ph.D., M.A. (State University of New York at Buffalo), B.A. (University of Michigan), Assistant Professor, Department of World Languages, Literatures and Cultures, 2013.
- Verma, Lalit R.**, Ph.D. (University of Nebraska-Lincoln), M.S. (University of Montana), B. Tech. (J.N. Agricultural University, Jabalpur, India), Professor, Department of Biological and Agricultural Engineering, 2000.
- Villanova, Daniel**, Ph.D. (Virginia Tech University), B.S.B.A. (Appalachian State University), Assistant Professor, Department of Marketing, 2018.
- Villaseñor, Amelia**, Ph.D. (George Washington University), B.A. (Arizona State University), Assistant Professor, Department of Anthropology, .
- Vining, Benjamin R.**, Ph.D., M.A. (Boston University), B.A. Colgate University, Assistant Professor, Department of Anthropology, 2016.
- Viswanathan, Padma**, M.F.A. (University of Arizona), M.A. (Johns Hopkins University), B.A. (University of Alberta), Associate Professor, Department of English, 2010.
- Vyas, Reeta**, Ph.D. (State University of New York at Buffalo), M.S., B.S. (Banaras Hindu University), Professor, Department of Physics, 1984.
- ## W
- Wade, Les**, Ph.D. (University of California-Santa Barbara), M.F.A. (University of Georgia), M.A. (Duke University), B.A. (Tulane University), Professor, Department of Theatre, 2011.
- Wai, Jonathan**, Ph.D., M.S. (Vanderbilt University), M.A. (Claremont Graduate University), B.A. (Claremont McKenna College), Assistant Professor, Department of Education Reform, 2018.
- Walch, John S.**, M.F.A. (University of Texas at Austin), B.A. (Colorado College), Assistant Professor, Department of Theatre, 2016.
- Walker, Heather L.**, Ph.D., M.S.Ch.E., B.S.Ch.E. (University of Arkansas), Clinical Assistant Professor, Ralph E. Martin Department of Chemical Engineering, 2008.
- Walker, James M.**, Ph.D. (University of Colorado-Boulder), M.S., B.S. (Louisiana Polytechnic Institute), Professor, Department of Biological Sciences, 1965.
- Waller, Matthew A.**, Ph.D., M.S. (Pennsylvania State University), B.S. (University of Missouri-Columbia), Professor, Department of Supply Chain Management, 2002.
- Walsh, Lora**, Ph.D. (Northwestern University), M.Sc. (University of Edinburgh), B.A. (Pepperdine University), Visiting Assistant Professor, Department of English, 2014.
- Waltensperger, George**, Ph.D. (University of Oklahoma), Instructor, Operations Management Program, 2019.
- Wamishe, Yeshe Andenow**, Ph.D. (University of Arkansas) M.S., B.S. (Addis Ababa University, Ethiopia), Associate Professor, Department of Entomology and Plant Pathology, 2011.
- Wang, Feng**, Ph.D. (University of Pittsburgh), Ph.D. (Kutztown University of Pennsylvania), Associate Professor, Department of Chemistry and Biochemistry, 2012.
- Wang, Ya-Jane**, Ph.D. (Iowa State University), M.S. (University of Minnesota-Twin Cities), B.S. (National Taiwan University), Professor, Department of Food Science, 1999.
- Wang, Yao-Chin**, Ph.D. (Oklahoma State University), M.B.A., B.Ec. (National Chung Cheng University), Assistant Professor, School of Human Environmental Sciences, 2017.
- Wang, Yong**, Ph.D., M.S. (University of California, Los Angeles), B.S. (University of Science and Technology of China), Assistant Professor, Department of Physics, 2016.
- Ward, Barry M.**, Ph.D. (Rutgers State University-New Brunswick), M.Sc., B.A.Mod. (Trinity College, Dublin), Associate Professor, Department of Philosophy, 2002.
- Ward, Cortez**, M.S. (Troy University), B.S. (University of Maryland), Instructor, Operations Management Program, 2006.
- Ward, Heidi**, Ph.D. (University of Oklahoma), D.V.M. (Oklahoma State University), B.S. (University of Oklahoma), Assistant Professor, Department of Animal Science, 2015.
- Wardlow, George W.**, Ph.D. (The Ohio State University), M.Ed., B.S. (University of Missouri-Columbia), Professor, Department of Agricultural Education, Communications and Technology, 1992.
- Ware, Morgan**, Ph.D. (North Carolina State University), B.S. (Florida State University), Assistant Professor, Department of Electrical Engineering, 2005.
- Warren, Ron**, Ph.D. (Indiana University), M.A. (Colorado State University), B.A. (Michigan State University), Associate Professor, Department of Communication, 1997.
- Warren, W. Dale**, M.M. (University of Kentucky), B.S. (Austin Peay State University), Professor, Department of Music, 1991.
- Washington, Tyrone A.**, Ph.D., B.S. (University of South Carolina at Columbia), Associate Professor, Department of Health, Human Performance and Recreation, 2011.
- Watkins, Kenton Bradley**, Ph.D. (Oklahoma State University), M.S., B.A. (University of Arkansas), Professor, Department of Agricultural Economics and Agribusiness, 2002.
- Watkins, Patsy**, Ph.D. (University of Iowa), M.A., B.A. (University of Texas, Austin), Associate Professor, School of Journalism and Strategic Media, 1983.
- Watson, Angela R.**, Ph.D. (University of Arkansas), Lecturer, Department of Curriculum and Instruction, 2019.
- Way, Kelly Ann**, Ph.D., M.S., B.S. (Oklahoma State University), Associate Professor, School of Human Environmental Sciences, 2006.
- Weatherby, Danielle**, J.D. (University of Florida), B.A. (Franklin and Marshall College), Associate Professor, School of Law, 2013.
- Webb, Jennifer D.**, Ph.D. (Oklahoma State University), M.S., B.S. (University of Tennessee), Associate Professor, Department of Interior Design, 1999.
- Wejinya, Uchechukwu C.**, Ph.D., M.S., B.S. (Michigan State University), Associate Professor, Department of Mechanical Engineering, 2008.
- Wells, Michael**, M.S. (Florida State University), B.S. (East Stroudsburg University), Instructor, Operations Management Program, 2011.
- Wells, Rob**, Ph.D. (University of Maryland), M.A. (St. John's College), Assistant Professor, School of Journalism and Strategic Media, 2016.
- West, Elliott**, Ph.D., M.A. (University of Colorado-Boulder), B.A. (University of Texas, Austin), Alumni Distinguished Professor, Department of History, 1979.
- Westerman, Erica L.**, Ph.D. (Yale University), M.Sc. (University of New Hampshire), B.S. (Yale University), Assistant Professor, Department of Biological Sciences, 2016.
- Whayne, Jeannie**, Ph.D., M.A., B.A. (University of California-San Diego), University Professor, Department of History, 1990.
- White, Calvin**, Ph.D. (University of Mississippi), M.A., B.A. (University of Central Arkansas), Associate Professor, Department of History, 2007.

- Wickramasinghe, Ranil**, Ph.D. (University of Minnesota-Twin Cities), M.S., B.S. (University of Melbourne, Australia), Professor, Ralph E. Martin Department of Chemical Engineering, 2011.
- Wicks, Jan L.**, Ph.D., M.A. (Michigan State University), B.A. (University of Southwest Louisiana), Professor, School of Journalism and Strategic Media, 1994.
- Wicks, Robert Howard**, Ph.D. (Michigan State University), M.A. (University of Missouri-Columbia), B.A. (American University), Professor, Department of Communication, 1994.
- Wideman, Robert F.**, Ph.D. (University of Connecticut), B.A. (University of Delaware), Professor, Department of Poultry Science, 1993.
- Wilke, Stephen**, J.D., M.P.A. (University of Memphis), Instructor, Operations Management Program, 1996.
- Wilkerson, Weston**, M.F.A. (University of Tennessee), B.A. (Texas A&M University), Assistant Professor, Department of Theatre, 2014.
- Wilkins, Charles L.**, Ph.D. (University of Oregon), B.S. (Chapman College), Distinguished Professor, Department of Chemistry and Biochemistry, 1998.
- Williams, Amanda**, Ph.D., M.S., B.S. (Oklahoma State University), Assistant Professor, School of Human Environmental Sciences, 2017.
- Williams, Brent Thomas**, Ph.D. (University of Illinois, Urbana-Champaign), M.S. (University of Texas Southwestern Medical School), B.A. (Austin College), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2002.
- Williams, Brent D.**, Ph.D., M.S. (University of Arkansas), B.A. (Lyon College), Associate Professor, Department of Supply Chain Management, 2011.
- Williams, Darron**, Ph.D. (Northcentral University), M.S., M.B.A., B.S. (University of Memphis), Instructor, Operations Management Program, 2015.
- Williams, Donnie F.**, Ph.D. (Georgia Southern University), Clinical Assistant Professor, Department of Supply Chain Management, 2019.
- Williams, Patrick George**, Ph.D., M.A. (Columbia University), B.A. (University of Texas at Austin), Professor, Department of History, 1998.
- Williams, Rodney D.**, Ph.D., M.S., B.S.C.E. (University of Arkansas), Assistant Professor, Department of Civil Engineering, 1998.
- Williams, Stacy Goad**, Ph.D., M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, Department of Civil Engineering, 1997.
- Willson, John David**, Ph.D. (University of Georgia), B.S. (Davidson College), Associate Professor, Department of Biological Sciences, 2012.
- Wilson, Charles E.**, Ph.D., M.S. (University of Arkansas), B.S. (Arkansas State University), Professor, Department of Crop, Soil and Environmental Sciences, 2011.
- Wilson, Charles**, Ed.D., M.E., B.S. (University of Arkansas), Instructor, Operations Management Program, 2005.
- Winkle, Allison P.**, M.S. (University of Arkansas), Lecturer, Department of Rehabilitation, Human Resource and Communication Disorders, 2019.
- Wise, Rick**, Ph.D., M.S. (Southern Methodist University), B.S. (University of Arkansas), Research Professor, Department of Physics, 2014.
- Wissehr, Cathy**, Ed.D. (University of Missouri-Columbia), M.N.S.Ed., B.S. (Southeast Missouri State University), Clinical Associate Professor, Department of Curriculum and Instruction, 2009.
- Wolchok, Jeffrey Collins**, Ph.D. (University of Utah), M.S., B.S. (University of California at Davis), Associate Professor, Department of Biomedical Engineering, 2011.
- Wolf, Patrick J.**, Ph.D., M.A. (Harvard University), B.A. (University of Saint Thomas), Distinguished Professor, Department of Education Reform, 2006.
- Wood, Clinton M.**, Ph.D. (University of Texas at Austin), M.S.C.E., B.S.C.E. (University of Arkansas), Associate Professor, Department of Civil Engineering, 2013.
- Wood, Lisa S.**, Ph.D., M.S., B.S. (University of Arkansas), Clinical Associate Professor, Department of Crop, Soil and Environmental Sciences, 2012.
- Woodland, Janet C.**, Ph.D., M.A. (State University of New York at Stony Brook), B.A. (King's College), Teaching Assistant Professor, Department of Mathematical Sciences, 1993.
- Woods, Jordan Blair**, Ph.D., M.Phil (University of Cambridge), J.D. (University of California, Los Angeles), Assistant Professor, School of Law, 2016.
- Woods, Randall B.**, Ph.D., M.A., B.A. (University of Texas at Austin), Distinguished Professor, Department of History, 1971.
- Worden, Steven K.**, Ph.D. (University of Texas at Austin), M.A., B.A. (Portland State University), Associate Professor, Department of Sociology and Criminology, 1986.
- Worrell, Dan**, Ph.D., M.S., B.S. (Louisiana State University), Professor, Department of Management, 2005.
- Worthington, Margaret L.**, Ph.D. (North Carolina State University), M.S. (University of California-Davis), B.S. (Duke University), Assistant Professor, Department of Horticulture, 2016.
- Wright, Nia**, M.B.A. (Tulane University), B.S. (University of Arkansas), Instructor, Operations Management Program, 2009.
- Wu, Jingxian**, Ph.D. (University of Missouri-Columbia), M.S. (Tsinghua University), B.S. (Beijing University of Aeronautics and Astronautics), Associate Professor, Department of Electrical Engineering, 2008.
- Wu, Xintao**, Ph.D. (George Mason University), M.E. (Chinese Academy of Space Technology), B.S. (University of Science and Technology of China), Professor, Department of Computer Science and Computer Engineering, 2014.
- ## X
- Xiao, Min**, Ph.D. (University of Texas at Austin), B.S. (Nanjing University), Distinguished Professor, Department of Physics, 1990.
- Xinya, Liang**, Ph.D. (Florida State University), B.S. (Zhejiang Gongshang University, China), Assistant Professor, ESMR, 2014.
- ## Y
- Yancy-Taylor, Pamela N.**, Ed.D. (Freed-Hardeman University), Instructor, Department of Curriculum and Instruction, 2019.
- Yandell, Kay**, Ph.D., M.A. (Cornell University), B.A. (University of Arkansas), Associate Professor, Department of English, 2013.
- Yang, Song**, Ph.D., M.S. (University of Minnesota-Twin Cities), M.A. (Nankai University, China), B.A. (Branch College of Nankai, China), Professor, Department of Sociology and Criminology, 2002.
- Yazwinski, Tom**, Ph.D. (North Carolina State University), M.S. (University of Maine), B.S. (University of Vermont), University Professor, Department of Animal Science, 1977.
- Yeager, Mickey**, M.S. (University of Arkansas), M.A. (Liberty Baptist Theological Seminary), B.S. (University of Southern Mississippi), Instructor, Operations Management Program, 1989.
- Yeager, Timothy J.**, Ph.D., M.A. (Washington University in St. Louis), Professor, Department of Finance, 2006.
- Yoon, InJeong**, Ph.D. (University of Arizona), Assistant Professor, School of Art, 2017.
- Young, Chase R.**, M.F.A. (University of Arkansas), Instructor, School of Art, 2019.
- Young, Elizabeth Lee**, J.D. (George Washington University), B.A. (Hendrix College), Associate Professor, School of Law, 2008.
- Young, Heather D.**, Ph.D. (University of Arkansas), M.S. (University of Tennessee), B.S. (Arkansas Tech University), Associate Professor, Department of Curriculum and Instruction, 2007.
- Young, Kelly**, D.N.P. (University of South Alabama), M.S. (University of Oklahoma), B.S.N. (Southwestern Oklahoma State University), B.A.

(Grinnell College), Assistant Professor, Eleanor Mann School of Nursing, 2018.

Young, Rana N., M.F.A. (University of Nebraska), Visiting Assistant Professor, School of Art, 2019.

Yu, Fisher, Ph.D. (Arizona State University), M.S., B.S. (Peking University), Associate Professor, Department of Electrical Engineering, 2008.

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Zabelina, Darya, Ph.D. (Northwestern University), Assistant Professor, Department of Psychological Science, 2017.

Zajicek, Anna, Ph.D. (Virginia Polytechnic Institute and State University), M.S., B.S. (University of Silesia, Poland), Professor, Department of Sociology and Criminology, 1994.

Zamarro Rodriguez, Gema, Ph.D., M.S. (Centro de Estudios Monetarios y Financieros, Spain), B.A. (Universidad Carlos III de Madrid, Spain), Professor, Department of Education Reform, 2014.

Zamboanga, Byron L., Ph.D., M.A. (University of Nebraska), B.A. (University of California, Berkeley), Professor, Department of Psychological Science, 2020.

Zeng, Ka, Ph.D. (University of Virginia), M.A. (Virginia Polytech Institute and State University), B.A. (Foreign Affairs College, Beijing), Professor, Department of Political Science, 2000.

Zhan, Justin, Ph.D. (University of Ottawa, Canada), M.S. (Syracuse University), Professor, Department of Computer Science and Computer Engineering, 2019.

Zhang, Qingyang, Ph.D. (Northwestern University), M.S. (Loyola University–Chicago), B.S. (Beijing Normal University), Assistant Professor, Department of Mathematical Sciences, 2015.

Zhang, Shengfan, Ph.D., M.I.E. (North Carolina State University), B.M. (Fudan University, Shanghai), Associate Professor, Department of Industrial Engineering, 2011.

Zhang, Wen, Ph.D. (Purdue University), M.S. (University of Kansas), Assistant Professor, Department of Civil Engineering, 2011.

Zhao, Jiangchao, Ph.D. (University of Wisconsin-Madison), M.S., B.S. (China Agricultural University), Associate Professor, Department of Animal Science, 2015.

Zhao, Yue, Ph.D. (University of Nebraska-Lincoln), B.S. (Beijing University), Assistant Professor, Department of Electrical Engineering, 2015.

Zheng, Nan, Ph.D. (University of Michigan-Ann Arbor), M.S. (University of Rochester), B.S. (University of Science and Technology of China), Associate Professor, Department of Chemistry and Biochemistry, 2008.

Zhou, Wenchao, Ph.D. (Georgia Institute of Technology), M.S.M.E. (Xi'an Jiaotong University, Xi'an, China), B.S.M.E. (Huazhong University of Science and Technology, Wuhan, China), Assistant Professor, Department of Mechanical Engineering, 2014.

Zhu, Jun, Ph.D. (University of Illinois at Urbana-Champaign), M.S., B.S. (Zhejiang University, Hangzhou, China), Professor, Department of Biological and Agricultural Engineering, 2013.

Zhu, Yaguang, M.F.A. (University of Nebraska), Assistant Professor, Department of Communication, 2019.

Zies, Brenda June, Ph.D., M.A. (University of Arkansas), B.S. (East Texas State University), Teaching Assistant Professor, Department of Psychological Science, 2005.

Zilinsky, Anthony, M.B.A., B.A. (University of Connecticut), Instructor, Operations Management Program, 2002.

Zollinger, Richard, M.B.A., B.S. (Brigham Young University), Instructor, Operations Management Program, 2016.

Zou, Min, Ph.D., M.S.M.E. (Georgia Institute of Technology), M.S.A.E., B.S.A.E. (Northwestern Polytechnical University), Professor, Department of Mechanical Engineering, 2003.

Appendix

The Academic Common Market

The Academic Common Market is an interstate agreement among Southern states for sharing uncommon academic programs. Participating states are able to make arrangements for their residents who qualify for admission to enroll as in-state students for fee purposes.

The Common Market concept recognizes that it is impractical for every state to attempt development of programs in every field of knowledge. Each Southern state has programs which are not offered in some of the other states and which can accommodate additional students. Through the sharing of such programs, the market assists in eliminating unnecessary duplication and in increasing access to programs which meet the educational needs of the citizens of the South.

To enroll as an Academic Common Market student, you must:

1. Be accepted for admission into a program to which your state has obtained access for its residents through the Academic Common Market. Applications for admission should be made directly to the institution offering the program.
2. Obtain certification of residency from the Common Market coordinator for certification information.

The opportunities presently available at the University of Arkansas, Fayetteville, at in-state rates to residents of Southern states through the Academic Common Market are listed in the column to the right.

Academic Common Market Programs at the University of Arkansas

Program	Bachelor's	Master's	Ph.D	Ed.D.
Anthropology		WV		
Architecture	KY			
Athletic Training		KY		
Athletic Training		LA		
Kinesiology		LA	OK	
Kinesiology		GA		
Kinesiology		OK		
Landscape Architecture	DE			
Microelectronics-Photonics		OK		
Microelectronic Photonics			OK	
Philosophy			AL	
Philosophy			MS	
Public Policy			OK	

Student Residence Status for Tuition and Fee Purposes

Board Policy 520.8 (Revised January 18, 1985)

The full text of the University of Arkansas Board of Trustees policy statement 520.8, Student Resident Status for Tuition and Fee Purposes,

is provided below followed by a statement on implementing the policy at the University of Arkansas, Fayetteville.

Determination of Residence Status

I. Purpose

The purpose of these regulations is to enable the administrative officers of the University of Arkansas to classify students for the purpose of paying student fees, as either "in-state" or "out-of-state," so as to accord fairness and equity to the students of the University and to the public, which provides support for the educational services provided by the University.

II. Initial Classifications

1. A student shall be admitted to the University in an "in-state" or "out-of-state" status for university fee purposes, as established under these regulations.

Except as otherwise provided under these regulations, a student classified as "in-state" for university fee purposes at the time of admission must have established a bona fide domicile in Arkansas and must have resided continuously in this state in that bona fide domiciliary status for at least six consecutive months prior to the beginning of the term or semester for which fees are paid.

2. A bona fide domicile is a home of apparent true, fixed, and permanent nature, a place of actual residing for all purposes of living that may be distinguished from a temporary sojourn in this state as a student. The person claiming domicile in Arkansas must provide evidence of permanent connection with the State of Arkansas and demonstrate the expectation of remaining in this state beyond graduation. For purposes of implementing these policies, the administration is directed to articulate standards which will be applied in making the determination of residence.
3. Except as otherwise provided under these regulations, the domicile of an adult (18 years of age or older) or emancipated minor student shall be determined on the basis of his or her own domicile.
4. Except as otherwise provided under these regulations, the domicile and residence of an unemancipated minor student (less than 18 years of age) or an unmarried dependent who has not attained the age of 23 is legally that of the parents or surviving parent; or such other person legally standing in the place of a parent to the student and with whom the student in fact makes his or her home and who has been making substantial contributions to the support of the student for at least six consecutive months prior to the term or semester for which the fees are paid.
5. A student who cannot satisfy the criteria for Arkansas domicile and residence will be classified as an "out-of-state" student and will pay fees and tuition accordingly. The student on a temporary visa will be classified as a foreign student and will pay non-resident tuition and fees. A student who has been granted a permanent visa and has been domiciled in Arkansas for six consecutive months following receipt of the permanent visa shall be classified as an Arkansas resident for fee purposes.
6. The responsibility for registering under a proper classification for student fee purposes is placed upon the student. It is the duty of each student at each time of registration to call any question about residency classification status to the attention of the campus classification review officer in a timely fashion in order that the question may be settled (see IV Procedures).
7. The six-month period required in paragraph A of these regulations may be waived for persons, their spouses, and their unmarried children (who have not yet attained the age of 23) who move to

Arkansas with attendance at the University only a by-product of the primary purpose of establishing domicile in this state.

8. An unmarried student who has not reached the age of 23 years having one parent residing in Arkansas (for at least six consecutive months immediately prior to the beginning of the term or semester in which the fees are to be paid) may be considered an "in-state" student for fee purposes, even if that student resided outside the state with the other parent before coming to Arkansas to attend the University.
9. Marriage is recognized as emancipation for both females and males.
10. The spouse of a person continuously domiciled in Arkansas (for at least six consecutive months immediately prior to the beginning of the term or semester in which the fees are to be paid) upon request shall be classified as "in-state" for fee purposes.

III. Reclassifications

1. The initial classification of a student will not prejudice a different classification for following terms or semesters. However, a student's prior domicile is assumed to continue until he or she clearly establishes a new domicile in Arkansas (see IV Procedures).
2. A student previously classified as "out-of-state" may be reclassified as "in-state" for fee purposes if he or she has established a bona fide domicile in Arkansas and has resided continuously in this state in that bona fide domiciliary status for at least six consecutive months prior to his or her reclassification by the University. In order for an adult or an emancipated minor to establish a bona fide domicile in Arkansas for fee purposes, he or she must have left the parental home, must have established in this state a home of a permanent character as manifested objectively by good faith acts, and must have the expectation of remaining in this state beyond graduation. The single fact of presence in Arkansas for at least six months of attendance as a student enrolled in the University of Arkansas, or any other educational institution, neither constitutes nor necessarily precludes reclassification as one domiciled in Arkansas, but will be a factor to be considered.

IV. Procedures

1. A student shall have the burden of establishing any claim that he or she is entitled to be treated as "in-state" for fee purposes. Persuasive evidence to that effect must be presented in writing and verified under oath by the student. Mere claims of local domicile and duration of stay are of little weight. A student who knowingly gives erroneous information in an attempt to evade the payment of "out-of-state" fees may be subject to dismissal from the University.
2. All disputed classifications for student fee purposes, whether at initial enrollment or subsequent enrollments, and all disputed reclassifications will be decided initially on each campus by a classification review officer designated by each Chancellor.
3. The Chancellor of each campus will designate a campus classification appeal officer to receive petitions from decisions made by the campus classification review officer. Each campus classification appeal officer may, in his or her discretion, make investigations, receive evidence, and conduct informal hearings. After considering the case, the campus classification appeal officer will render a decision and notify the affected student of the decision in writing. Any decision of the campus classification appeal officer may be appealed to the Vice President for Academic Affairs of the University of Arkansas System, who shall recommend final disposition to the President of the University.

4. Written notice of the appeals procedure will be provided to each student raising a question about his or her status with the campus residency classification review officer.
5. Determination of domicile will be based on a review of all pertinent facts, evidence, and circumstances which collectively show, in an objective and clear manner, the actual domicile of the student.

Note: In implementing these policies, it is presumed that dependent students who are classified as non-residents based upon parental/guardian domicile outside of Arkansas do not acquire Arkansas residency under Board of Trustees Policy 520.8 unless and until their parent(s)/guardian(s) have established a domicile in Arkansas, or the student has left the parental home and established a domicile in Arkansas evidenced by proof that he or she has established a home of a permanent character as manifested objectively by good faith acts, resided in Arkansas in bona fide domiciliary status for at least six consecutive months prior to his or her reclassification as an Arkansas resident, and demonstrates the expectation of remaining in this state beyond graduation.

Reclassification Deadlines

Students who have established a bona fide domicile in Arkansas following initial classification as a non-resident must request reclassification if they want their status recognized for fee purposes. Applications and appropriate documentation must be received by the Office of the Registrar no later than the fifth class day (second class day of a summer session) of the term for which in-state fee assessment is requested. Applications received after the deadline will be considered for the next term. All fees are to be paid by published due dates. Students who receive a favorable decision after payment will be provided a refund of out-of-state fees paid. Please direct questions about residence classification review procedures to the Registrar, 146 Silas H. Hunt Hall.

Residence Status of Native Americans

Board Policy 520.1 (Revised January 29, 1989)

Native American people in other states belonging to tribes that formerly lived in Arkansas before relocation, and whose names are on the rolls in tribal headquarters, shall be classified as in-state students of Arkansas for tuition and fee purposes on all campuses of the University of Arkansas. Tribes so identified include the Caddo, Cherokee, Chickasaw, Choctaw, Creek, Delaware, Kickapoo, Osage, Peoria, Quapaw, Shawnee, and Tunica.

Residence Status of Members of the Armed Forces and Their Dependents

Board Policy 520.7 (Revised January 18, 1985)

Effective January 1, 1975, members of the Armed Forces who are stationed in the state of Arkansas pursuant to military orders, and their unemancipated dependents, shall be entitled to classification as in-state students for fee-paying purposes (per Arkansas Stat. Ann. 80-3366).

Persons continuously domiciled in Arkansas for at least twelve consecutive months, who enter active military service from this state and who maintain Arkansas as the permanent home of record while on active military duty, and their dependents, shall be entitled to classification as in-state students for fee-paying purposes. This provision is forfeited if the military person does not return to Arkansas within twelve months after separation, discharge, or retirement from active duty.

Persons serving in active military service who demonstrate a change of bona fide domicile from another state to Arkansas at least twelve

consecutive months prior to separation, discharge, or retirement from active military duty, and their dependents, shall be entitled to classification as in-state students for fee-paying purposes. This provision is forfeited if the military person does not return to Arkansas within twelve months after separation, discharge, or retirement from active duty.

Residence Status of Students from Texarkana, Texas, and Bowie County, Texas

Board Policy 520.10 (Adopted November 16, 1984)

In accordance with the reciprocity agreement described in H.C.R. 32, signed by the Governor of Arkansas on February 12, 1965, residents of Texarkana, Texas, and Bowie County, Texas, will be classified as in-state students for university fee purposes at the University of Arkansas.

Courses of Instruction

Courses listed in this section describe all courses approved for offering by the University of Arkansas. The courses are listed alphabetically by subject with the subject code in parenthesis following. The word "course" refers to a unit of academic instruction, while the word "class" refers to a course that has been scheduled during a semester or summer session with a certain number of prescribed meetings each week. Many courses are offered as classes every semester while many others are offered less frequently. Successful completion of a class usually earns a specified number of semester hours of credit toward a degree.

To see a Schedule of Classes, which lists classes available in a specific semester, along with the instructor of record, time and place the class is being held, go to UACONNECT (<https://uaconnect.uark.edu/>).

How to Read a Course Description

Courses listed in this section describe all courses approved for offering by the University of Arkansas. The courses are listed alphabetically by code. The word "course" refers to a unit of academic instruction, while the word "class" refers to a course scheduled during a semester or summer session with a certain number of prescribed meetings each week. Successful completion of a class usually earns a specified number of semester hours of credit toward a degree.

The Schedule of Classes lists classes available in a specific semester, along with the instructor of record, time and place the class is being held.

Course Description Explanations

A course listing comprises the following elements, in order:

Course Prefix: This alpha descriptor is the first identifying part of a course. This four-letter code represents the course prefix name. Usually the course prefix will be the same as the department offering the course, but occasionally the prefix is one of many different courses offered in a single department. For example, ARAB refers to Arabic courses, which are offered through the Department of World Languages, Literatures and Cultures; HIST refers to History courses.

Course Number: Each course is designated by a four-digit number. The first digit identifies the level of the course: 1, freshman level; 2, sophomore level; 3 and 4, junior-senior level; 5, 6, and 7, graduate level. Any exceptions to this practice are stated in the course descriptions.

Students desiring admission to courses offered at levels beyond their standing should request the instructor's permission to enroll. (For definitions of academic level see Student Classification (<http://>

catalog.uark.edu/undergraduatecatalog/orientationandregistration/studentclassification/.)

The second and third digits of the number identify the course within the department that offers it.

The fourth digit identifies the semester-hour value of the course. Credit for certain courses does not count toward some degrees.

Normally, courses meet once each week for 50 minutes for each hour of course credit. Laboratory, drill and other kinds of activity courses typically meet for two 50-minute periods per week for each hour of credit.

The letter 'V' is used in place of the last digit for those courses in which credit is variable. The minimum and maximum credit hours possible are given in parentheses after the course title.

The letter 'X' is used in place of the last digit for those courses in which fixed credit is ten or more hours.

The first three digits of the number are the same for corequisite courses (for example, a lecture and the corequisite lab or drill).

Course Suffix: A suffix to the course number further identifies the specific type of instruction:

- C - Drill or Lab Component
- L - Laboratory
- H - Honors Course
- M - Honors Laboratory

A course with no suffix is a typical lecture course (not an honors course).

Course Title: The title of the course is printed in bold letters.

Course Semester Offering: Course titles are followed by abbreviations (in parentheses) for the semester in which the course is normally offered. Cross-check with the Schedule of Classes to determine if a course is being offered. Courses marked (Sp) will be offered in the spring, courses marked (Fa) will be offered in the fall, courses marked (Su) will be offered in the summer, and courses marked (Irregular) will be offered irregularly. Consult the Schedule of Classes to verify that a course is being offered for a given term.

Course Description: A brief description of the course content and its major emphasis are stated. If the course is cross-listed (also offered under another course number) a "Same As" statement will be included in the description. If the course is eligible to be repeated for degree credit more than once, a statement will appear to indicate the total hours or times a course may be repeated. If no repeated statement is listed, the course may be used for degree credit only once.

Requisites: Requisites are requirements that must be fulfilled either before a course may be taken or at the same time a course is taken. It is the student's responsibility to make sure the proper prerequisites have been completed before enrolling in any class. Prerequisites are courses or requirements that must be completed prior to enrolling in a certain course. Courses may have prerequisites from inside and outside the department. It is the student's responsibility to make sure he/she has completed the proper prerequisites before enrolling in any class. Courses listed as corequisite are to be taken in the same semester as the course desired.

A course listed as both a pre- and corequisites are requirements that if not taken prior to enrolling in a course, must be taken during the same semester as the course.

Students may not enroll in courses for which they do not have the necessary requisites. Students who are in doubt concerning their eligibility to enroll in specific courses should consult with their academic adviser. Students may be dropped from courses for which they do not have the necessary requisites.

Courses of Instruction By Subject

- Accounting (ACCT) (p. 494)
- Adult and Lifelong Learning (ADLL) (p. 496)
- African and African American Studies (AAST) (p. 497)
- Agricultural Communications (ACOM) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/acom/>)
- Agricultural Economics (AGEC) (p. 498)
- Agricultural Education (AGED) (p. 499)
- Agricultural Leadership (AGLE) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/agle/>)
- Agricultural Statistics (AGST) (p. 500)
- Agricultural Systems Technology Management (ASTM) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/astm/>)
- Animal Science (ANSC) (p. 501)
- Anthropology (ANTH) (p. 502)
- Apparel Merchandising and Product Development (AMPD) (p. 505)
- Applied Music (Class) (MUAC) (p. 506)
- Applied Music (Private Instruction) (MUAP) (p. 506)
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- Biology (BIOL) (p. 511)
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- Career and Technical Education (CATE) (p. 516)
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- Civil Engineering (CVEG) (p. 519)
- Communication (COMM) (p. 522)
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- Community College Leadership (CCLE) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/ccle/>)
- Computer Science and Computer Engineering (CSCE) (p. 525)
- Counselor Education (CNED) (p. 529)
- Crop, Soil and Environmental Sciences (CSES) (p. 531)
- Curriculum and Instruction (CIED) (p. 533)
- Economics (ECON) (p. 537)
- Education Reform (EDRE) (p. 538)

Educational Equity (EDEQ) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/edeq/>)

Educational Foundations (EDFD) (p. 540)

Educational Leadership (EDLE) (p. 540)

Educational Statistics and Research Methods (ESRM) (p. 541)

Educational Technology (ETEC) (p. 542)

Electrical Engineering (ELEG) (p. 543)

Engineering Management (EMGT) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/emgt/>)

English (ENGL) (p. 546)

English Language and Cultural Studies (ELAC) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/elac/>)

Entomology (ENTO) (p. 548)

Environmental Dynamics (ENDY) (p. 549)

Environmental Science (ENSC) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/ensc/>)

Ethnomusicology (MUSY) (p. 550)

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Fay Jones Architecture and Design (FJAD) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/fjad/>)

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Health, Human Performance and Recreation (HHPR) (p. 559)

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Hospitality Management (HOSP) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/hosp/>)

Human Development and Family Sciences (HDFS) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/hdfs/>)

Human Environmental Sciences (HESC) (p. 567)

Human Resource and Workforce Development Education (HRWD) (p. 568)

Industrial Engineering (INEG) (p. 569)

Information Systems (ISYS) (p. 572)

Japanese (JAPN) (p. 574)

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Kinesiology (KINS) (p. 575)

Latin (LATN) (p. 575)

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Music Education (MUED) (p. 582)

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Occupational Therapy (OCTH) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/octh/>)

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Operations Management (OMGT) (p. 588)

Philosophy (PHIL) (p. 591)

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Physics (PHYS) (p. 593)

Plant Pathology (PLPA) (p. 595)

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Recreation and Sport Management (RESM) (p. 603)

Rural Sociology (RSOC) (p. 604)

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Secondary Education (SEED) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/seed/>)

Social Work (SCWK) (p. 604)

Sociology (SOCL) (p. 606)

Space and Planetary Sciences (SPAC) (p. 607)

Spanish (SPAN) (p. 608)

Special Education (SPED) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/sped/>)

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Statistics (STAT) (p. 608)

STEM Education for Early Childhood (STEM) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/stem/>)

Supply Chain Management (SCMT) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/scmt/>)

Sustainability (SUST) (<http://catalog.uark.edu/graduatecatalog/coursesofinstruction/sust/>)

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Walton College of Business (WCOB) (p. 613)

World Languages, Literatures and Cultures (WLLC) (p. 613)

World Literature (WLIT) (p. 614)

Courses

OPAN 5003. Introduction to Operations Analytics. 3 Hours.

An introduction to operations analytics providing an understanding of the role of analytics within operational settings. Builds basic skill instruction in descriptive analytics and the communication of analytics. An overview of introductory techniques within the field of analytics and their application. (Typically offered: Fall, Spring and Summer)

OPAN 5013. Applied Predictive Analytics. 3 Hours.

This course focuses on the fundamental theory, methodologies, algorithms and software tools for predictive analytics. The main goal is to equip the students with the basic knowledge and skills to solve common predictive analytics problems arising from various applications. Methodologies covered in this course include linear and non-linear regression, additive models, ensemble trees, model assessment and selection, Artificial Neural Network. Students will learn how to implement the methods using popular statistical computing and analytics tools. Working knowledge of multi-variate calculus based probability and statistical inference is expected. Prerequisite: OPAN 5003. (Typically offered: Fall, Spring and Summer)

OPAN 5023. Applied Prescriptive Analytics. 3 Hours.

Methods, algorithms, and techniques for optimization models used in analytics applications. Coverage includes model formulation, solution methods and the use of optimization software. Prerequisite: OPAN 5003. (Typically offered: Fall, Spring and Summer)

OPAN 5713. Simulation Analytics. 3 Hours.

An overview of Monte Carlo computer simulation methods and their application within analytics. Generation of random variates from univariate and multi-variate distributions. Probability model representation and fitting methods. Computing methods for simulating and estimating random processes. Bootstrapping procedures. Statistical reasoning and decision making under uncertainty. Working knowledge of calculus-based probability and statistics and computer programming is expected. (Typically offered: Fall and Summer)

OPAN 5903. Operations Analytics Capstone. 3 Hours.

Comprehensive analytics project. Conduct background research, data collection, and preliminary analysis; define objectives, performance measures, and deliverables; apply analytics methods, develop recommended solutions, and document solution and benefits. Course should be taken in the term prior to meeting degree requirements. Students cannot receive credit for both OPAN 5903 and OPAN 5913. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

OPAN 5913. Operations Analytics Industrial Practicum. 3 Hours.

Student must apply to enroll in this course. Students must be employed within an analytics organization in industry. Prior approval to use an organization's analytics project as the basis of the student's course project must be obtained. A project report documenting the application of analytics performed by the student within the organization is required. An evaluation by the student's supervisor on the technical aspects of the student's work will be required in addition to an evaluation by the course instructor. The student's supervisor must be an analytics professional. Course should be taken in the term prior to meeting degree requirements. Students cannot receive credit for both OPAN 5903 and OPAN 5913. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer)

Accounting (ACCT)

Courses

ACCT 510V. Special Topics in Accounting. 1-3 Hour.

(Formerly ACCT 410V.) Explore current events, concepts and new developments relevant to Accounting not available in other courses. Graduate degree credit will not be given for both ACCT 410V and ACCT 510V. Prerequisite: ACCT 3723 with a grade of C or better. (Typically offered: Irregular) May be repeated for degree credit.

ACCT 5123. Corporate Governance and Professionalism. 3 Hours.

Aspects of corporate governance related to establishing an ethical corporate culture are addressed. The course examines various aspects of accounting and business ethics including frameworks for ethical reasoning; professional values - including integrity, objectivity, accounting independence, and professional skepticism; and other core values relevant for accountants. Accounting professional ethics codes and rules are also addressed. Corporate governance structures are examined. Prerequisite: Graduate standing in the Masters of Accountancy program. (Typically offered: Irregular)

ACCT 5223. MBA Accounting Analysis. 3 Hours.

Highlights the role played by accounting information in managing supply chains and retail operations. Provides tools for managing cost flows, including activity-based costing, retail accounting, and operational budgeting. Focuses on improving decision making processes, and linking the impact of retail/supply chain decisions to financial statements and shareholder value. (Typically offered: Fall and Spring)

ACCT 5263. Financial Statement Analysis for Executives. 3 Hours.

This course provides a framework for understanding the intersection between business strategy, accounting, economics, and finance. Using historical financial statements as the primary information input, you will employ tools that enable you to better understand the drivers of current performance and risk, forecast future performance, and construct a value estimate. These tools can be applied in a number of contexts including equity valuation, project selection, and managerial evaluation. Not eligible for MAcc program students. Prerequisite: MBA Director consent. (Typically offered: Summer)

ACCT 535V. Professional Accounting Internship. 1-3 Hour.

This course allows a student to experience an internship within a business and benefit from the applied experience. The internship may be designed to offer a wide range of professional accounting experiences in Industry or Public Accounting. The internship must be supervised by a faculty member as well as a member of the firm. MAcc Director approval required. Prerequisite: MAcc Director consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ACCT 5413. Advanced Financial Accounting. 3 Hours.

Integrated course which examines the financial reporting, tax, managerial, systems and auditing aspects of major corporate restructurings arising from events such as mergers, acquisitions, spinoffs, reorganizations and downsizing. Prerequisite: ACCT 3753 or equivalent with a grade of C or better or MAcc Director consent. (Typically offered: Spring)

ACCT 5433. Fraud Prevention and Detection. 3 Hours.

An examination of various aspects of fraud prevention and detection, including the sociology of fraud, elements of fraud, types of fraud involving accounting information, costs of fraud, use of controls to prevent fraud, and methods of fraud detection. (Typically offered: Irregular)

ACCT 5443. Asset Management. 3 Hours.

Managing assets to achieve corporate strategy. Included are issues such as strategy formulation, acquisition processes, internal controls, system requirements, accounting measurements, inventory models, re-engineering, capital budgeting, tax issues, and discussion of current business events that have ethical implications. (Typically offered: Irregular)

ACCT 5463. Financial Statement Analysis. 3 Hours.

This course provides a framework for understanding the current economic position and future prospects of firms using corporate financial statements. Specifically, the student will study financial statements and their related footnotes in order to understand the drivers of current performance and risk, forecast future performance, and estimate the intrinsic value implied by those forecasts. These tools can be applied in a number of contexts including equity valuation, project selection, managerial evaluation, and corporate financial statement audits. Prerequisite: ACCT 3723 or equivalent with a grade of C or better. (Typically offered: Irregular)

ACCT 5483. Financial Accounting Research and Theory. 3 Hours.

This course explores our contemporary understanding of financial reporting incentives and outcomes. The course draws upon existing research on the determinants and consequences of financial reporting and examines the roles of various constituents including investors, lenders, financial analysts, managers, regulators, and auditors within the financial reporting environment. Prerequisite: Graduate standing and MAcc Director consent. (Typically offered: Irregular)

ACCT 549V. Special Topics in Accounting. 1-3 Hour.

Seminar in current topics not covered in other courses. Students may enroll in one or more units. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

ACCT 5523. Advanced Accounting Information Systems. 3 Hours.

This course describes accounting systems in technologically advanced environments. Controls and other technical design considerations are described for the input, processing, storage, and reporting of accounting information. Special topics, such as expert systems and artificial intelligence applications in financial accounting, auditing, and tax also receive considerable attention. Prerequisite: MAcc Director consent. (Typically offered: Irregular)

ACCT 5673. Product, Project and Service Costing. 3 Hours.

(Formerly ACCT 4673.) Cost systems with emphasis on information generation for cost management of products, projects and services. The course includes spreadsheet and other computer program analysis. Graduate degree credit will not be given for both ACCT 4673 and ACCT 5673. Prerequisite: ACCT 2023 and ACCT 3723 each with grades of C or better. (Typically offered: Fall)

ACCT 5703. Governmental/Nonprofit Accounting. 3 Hours.

The course will critically examine current issues in governmental and non-profit accounting, financial statement compliance and control for governmental and non-profit entities, and auditing for government and other non-profit organizations. Topics will include examination of state and local government accounting and reporting; sources and applications of taxes and program resources; not-for-profit organization accounting including taxation, regulatory, performance, and compliance issues; industry specific issues in accounting for health care organizations and colleges and universities; and federal governmental accounting. The course will also examine the application processes and compliance procedures for not-for-profit organizations and grants, and will provide a brief introduction to urban planning and economics. Prerequisite: MAcc Director consent. (Typically offered: Irregular)

ACCT 5853. State and Local Taxation. 3 Hours.

This course provides an overview of the basic principles of state and local taxation and the federal constitutional limits for state and local taxing authorities. Emphasis will be on the impact on individuals and multistate entities of income tax, sales tax, property taxes and hybrid tax systems. Prerequisite: ACCT 4203 or graduate standing. (Typically offered: Spring)

ACCT 5863. Taxation of Flow-Through Entities. 3 Hours.

In-depth coverage of the federal tax treatment of pass-through entities and their owners, including Partnerships, LLCs, and S Corporations. Prerequisite: Graduate Standing and MAcc Director Consent, including completion of ACCT 4203. (Typically offered: Spring)

ACCT 5873. Advanced Taxation. 3 Hours.

In-depth coverage of the tax treatment of corporations including advanced tax issues. Introduction to tax research including the organization and authority of tax law; accessing and using the tax law; and, applying tax law to taxpayer scenarios. Prerequisite: ACCT 4203 or equivalent with a grade of C or better. (Typically offered: Fall)

ACCT 5883. Tax Planning. 3 Hours.

In-depth coverage of the tax treatment of passthrough business entities including advanced tax issues. Overview of the income tax treatment of estates and trusts. Overview of the essentials of estate and gift taxation. Prerequisite: ACCT 3843 or equivalent with a grade of C or better. (Typically offered: Spring)

ACCT 5893. Multi-jurisdictional Tax Issues. 3 Hours.

This course provides an in-depth examination of multi-jurisdictional tax issues including U.S. federal income taxation of inbound and outbound transactions, state and local taxation, and multi-jurisdictional tax policy issues. Pre- or Corequisite: ACCT 5873. (Typically offered: Spring)

ACCT 5953. Auditing Standards. 3 Hours.

Professional aspects of financial statement auditing and registered auditors. Including ethics and legal responsibilities; internal control testing; critical evaluation of evidence; application of sampling; and reporting problems. Prerequisite: ACCT 4963 or equivalent with a grade of C or better. (Typically offered: Fall)

ACCT 5963. Audit and Assurance Services. 3 Hours.

(Formerly ACCT 4963.) Professional standards and procedures as applied to external and internal assurance engagements. Including coverage of the economic role of assurance providers, engagement planning, risk assessment, evidence gathering, and reporting. Graduate degree credit will not be given for both ACCT 4963 and ACCT 5963. Prerequisite: ACCT 3723 with a grade of C or better. (Typically offered: Fall and Spring)

ACCT 5993. Energy Accounting. 3 Hours.

(Formerly ACCT 4883.) This course covers the basic issues of accounting and financial reporting for energy issues including hydrocarbon production, processing and sales as well as accounting for wind, solar and other alternative energy sources. Covers national and international energy policy, relevant public policy, environmental and geological issues, and considers environmental law, climate and economic topics relevant to energy topics. Graduate degree credit will not be given for both ACCT 4883 and ACCT 5993. Prerequisite: ACCT 3723 and ACCT 3753 each with a grade of B or better, and admission to the MAcc program. (Typically offered: Irregular)

ACCT 6013. Graduate Colloquium. 3 Hours.

Presentation and critique of research papers and proposals. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ACCT 6033. Accounting Research Seminar I. 3 Hours.

First course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, managerial accounting and behavioral accounting. (Typically offered: Irregular)

ACCT 6133. Accounting Research Seminar II. 3 Hours.

Second course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, financial accounting, managerial accounting, behavioral accounting, tax, audit, international accounting, and education. Prerequisite: ACCT 6033. (Typically offered: Irregular)

ACCT 6233. Accounting Research Seminar III. 3 Hours.

Third course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, financial accounting, managerial accounting, behavioral accounting, tax, audit, international accounting, and education. Prerequisite: ACCT 6033. (Typically offered: Irregular)

ACCT 636V. Special Problems in Accounting. 1-6 Hour.

Special research project under supervision of a graduate faculty member. (Typically offered: Fall and Spring)

ACCT 6633. Accounting Research Seminar V. 3 Hours.

Fifth course in the accounting research seminar sequence which explores and evaluates current accounting literature. Course content reflects recent developments in the literature and specific interests of participants. Examples of potential topics include research methods in accounting, financial accounting, managerial accounting, behavioral accounting, tax, audit, international accounting, and education. Prerequisite: ACCT 6033. (Typically offered: Irregular)

ACCT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Adult and Lifelong Learning (ADLL)

Courses

ADLL 5113. Perspectives in Adult Education. 3 Hours.

Historical overview of the evolving field of adult education and lifelong learning in responsibilities of adult education providers and reviews the expansion of adult and lifelong learning opportunities associated with societal and demographic shifts. (Typically offered: Fall and Spring)

ADLL 5123. Principles and Practices of Adult Learning. 3 Hours.

Overview of the adult learner including characteristics, motivation for participating in learning, and strategies for developing educational programs for diverse adult populations. (Typically offered: Fall and Summer)

ADLL 5133. Curriculum Development in ABE and ASE. 3 Hours.

Curriculum development in Adult Basic Education (ABE) and Adult Secondary Education (ASE) settings including the various educational functioning levels, measures to assess student levels, selection of teaching materials, and development of curriculum utilizing instructional standards for ABE and ASE programs. (Typically offered: Fall)

ADLL 5143. Instructional Strategies and Assessment in Adult Education. 3 Hours.

Selection and utilization of materials and instructional methods for use in adult learning settings. Evaluative strategies to develop or select appropriate tools and techniques predicated upon the needs and goals of adult learners. (Typically offered: Spring)

ADLL 5153. Organization and Administration of Adult and Lifelong Learning Programs. 3 Hours.

Legal, ethical, staffing, and financial considerations for the development and implementation of programs for adult and lifelong learners in various programs including literacy centers, GED centers, community education, lifelong/leisure learning, and postsecondary education. (Typically offered: Spring)

ADLL 5163. Managing Change in Adult and Lifelong Learning. 3 Hours.

Strategies for planning, organizing, and facilitating change in programs that serve adult learners from diverse populations, across varied developmental stages and geographic locations. Discussion of social change that has impacted adult education and analysis of change models relevant to individuals, groups and organizations. (Typically offered: Fall and Summer)

ADLL 5173. Program Planning. 3 Hours.

Program development process for adult and lifelong learners. Overview of assessment, developing program objectives, identifying resources, and designing program plans. (Typically offered: Summer)

ADLL 5183. Technology and Innovation in Adult Learning. 3 Hours.

Techniques for designing, developing, implementing, and assessing technology-mediated adult and lifelong learning programs. Discussion of issues relevant to the use of innovative strategies for delivering instruction via emerging technologies and their potential impact on content and learning outcomes. (Typically offered: Summer)

ADLL 5193. Seminar in Adult and Lifelong Learning. 3 Hours.

Seminars focused on topics related to adult and lifelong learning. (Typically offered: Spring and Summer)

ADLL 5213. Adult and Lifelong Learning Internship. 3 Hours.

Internship in adult and lifelong learning settings. (Typically offered: Fall and Spring)

ADLL 5223. Adult and Lifelong Learning Applied Project. 3 Hours.

Development and Implementation of a project focused on adult and lifelong learning. Consent of advisor/instructor required. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

ADLL 5233. Independent Study. 3 Hours.

Provides students with an opportunity to pursue special study in adult and lifelong learning. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ADLL 6113. Advanced Adult Learning Theory. 3 Hours.

Advanced study of theories and models of adult and lifelong learning with an emphasis on current trends, recent research, and issues affecting the field. Issues covered will include critical theory and advancements in neuroscience and cognition as they relate to adult learning and lifespan development. (Typically offered: Irregular)

ADLL 6123. Leadership and Ethics in Adult and Lifelong Learning. 3 Hours.

This doctoral course focuses on leadership principles and ethical considerations that are critical to developing and sustaining adult education programs that benefit individuals, organizations, and communities. Course content will include case study analysis and lectures from scholar-practitioners from the field. (Typically offered: Irregular)

ADLL 6133. Analysis of International Adult and Lifelong Programs. 3 Hours.

Survey of the historical and philosophical events which have shaped adult and lifelong learning worldwide. Discussion of issues affecting adult education and lifelong learning including globalization, educational access, and variance in national policies. (Typically offered: Irregular)

ADLL 6143. Instructional Adaptation and Innovation in Adult and Lifelong Learning. 3 Hours.

An overview of teaching and learning methods, styles, and techniques which are applicable when facilitating adult learners across diverse settings. Content to include teaching and learning style assessment, accommodating learning styles, physical and learning disabilities, language differences and cultural norms. (Typically offered: Irregular)

ADLL 6153. Policy and Public Governance of Adult and Lifelong Learning Programs. 3 Hours.

Policy analysis and public governance issues in adult and lifelong learning with emphasis on state and federal programs. Discussions of how to evaluate, design, and implement policy focused on promoting adult and lifelong learning activities in a myriad of organizations. Overview of trends and current issues related to policy and public governance of adult and lifelong learning. (Typically offered: Irregular)

ADLL 6173. Current Issues. 3 Hours.

Exploration and discussion of current issues relative to adult education and lifelong learning. Focus on the review and application of current research as it relates to practice. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ADLL 6183. Organization Development, Learning, and Change. 3 Hours.

Using a system perspective, this course examines the theories and practices associated with organization development, learning and change to understand the dynamic nature of organizational life. This course examines the structural frame, the human resource frame, the political frame, and the symbolic frame that influences organizational behavior and learning. The course investigates strategies and best practices for managing and leveraging this dynamism to build organizational capacity and improve performance. (Typically offered: Fall and Spring)

ADLL 6213. Signature Pedagogy: Teaching and Learning in Community Colleges. 3 Hours.

Using a learning-centered change model, this course examines how community colleges can shift from a traditional teaching-centered paradigm to one that is learning-centered. This course examines the context of the learning college, strategic planning for a learning-outcomes approach to governance, the role of student development and technology in the learning college, and implementing and assessing learning-centered strategies. (Typically offered: Irregular)

ADLL 6223. Workforce and Community Development. 3 Hours.

This course provides an overview of how community colleges influence workforce, economic, and community development through their education missions. The course will examine the community college's expanding role in economic and community development through workforce development programs. Emphasis will be placed on program structure, best practices in program development, and partnerships and collaboration with various stakeholders. (Typically offered: Irregular)

ADLL 6233. Survey and Significance of the American Community College. 3 Hours.

A comprehensive overview of the American community college, its history, its ever-evolving purpose and the challenges it faces. Course content will focus on the administrators and faculty who lead, the students they serve, and components such as developmental education, integrative education and transfer education. Discussion will include occupational and community education and issues related to accountability. Special attention will be paid to how this unique and complex institution remains relevant and significant to the community. (Typically offered: Irregular)

ADLL 6243. Current Trends in Community Colleges. 3 Hours.

This course examines environmental factors that influence the organization and administration of community colleges. Trends related to funding, policy, staffing, and workforce development are examined and contextualized to the evolving community college mission. (Typically offered: Irregular)

ADLL 6253. Professional Development in Adult and Lifelong Learning. 3 Hours.

This course examines career planning and development, performance management, and professional development in various settings. The focus of the course will be on concepts associated with Human Resource Development (HRD) and developing employees within an organization, as well as leading adults in transition in the community and in educational settings through the process of making career decisions. (Typically offered: Irregular)

ADLL 6313. Independent Study. 3 Hours.

Independent study of topics in adult and lifelong learning. (Typically offered: Irregular)

ADLL 6403. Quantitative Reasoning I for Adult Educators. 3 Hours.

Introduction to quantitative reasoning for educators and researchers in adult education. Topics include applying the hypothetico-deductive research process, describing data using statistical terminology, building statistical models, presenting data meaningfully, and using SPSS to analyze data from practical research problems. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. (Typically offered: Fall and Spring)

ADLL 6413. Quantitative Reasoning II in Adult and Lifelong Learning. 3 Hours.

Methodologies for designing descriptive, correlational, and experimental studies. Development of research questions, definition of variables, selection or development of instruments, data collection, analysis, interpretation and reporting of research results. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or equivalent. (Typically offered: Fall)

ADLL 6423. Qualitative Reasoning in Adult and Lifelong Learning. 3 Hours.

Methodologies for designing qualitative research studies in adult and lifelong learning settings. Selection of the appropriate qualitative tradition, selection of research subjects, development of data collection protocols, field work strategies, data analysis, data interpretation and presentation of data results. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. (Typically offered: Spring)

ADLL 6433. Program Evaluation. 3 Hours.

Overview of evaluation strategies in adult and lifelong learning programs that include: development of evaluation questions, selection or development of instrumentation, data collection methods, data analysis, and reporting of evaluation results. Emphasis on practical and ethical issues associated with evaluation processes. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or ADLL 6413 or ADLL 6423, or equivalent. (Typically offered: Spring)

ADLL 6443. Adult and Lifelong Learning Dissertation Seminar. 3 Hours.

Development of dissertation proposal. Formation of research question, selection of methodologies, development of problem statement, research questions, and identification of research variables, constructs of phenomena. Identification of data collection and data analysis procedures. This course meets in-person three to five times during the semester. Class dates are announced to ADLL students the preceding semester. Classes are held on campus on Saturdays from 9AM to 5PM. Participation is mandatory. Prerequisite: ADLL 6403 or ESRM 6403 or ADLL 6413 or ADLL 6423 or ADLL 6433, or equivalent. (Typically offered: Spring)

ADLL 6463. Advanced Qualitative Reasoning in Adult and Lifelong Learning. 3 Hours.

This qualitative methods course provides students with advanced instruction in qualitative data collection, field observations, records research, data analysis, and data display. In addition to reviewing various research studies that demonstrate different qualitative research approaches, students will practice some of the activities associated with executing a qualitative research study. Prerequisite: ADLL 6423 or instructor consent. (Typically offered: Irregular)

ADLL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

African and African American Studies (AAST) Courses

AAST 5003. Graduate Seminar in African & African American Studies. 3 Hours.

Introduction to graduate study of African & African American Studies through an interdisciplinary examination of the history of the discipline, research methods employed, and its relationship to other disciplines. (Typically offered: Irregular)

AAST 5103. Graduate Readings in African & African American Studies. 3 Hours.

An exploration of African & African American Studies topics independently with a faculty member. Topic variable with permission of faculty member. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

AAST 5903. Special Topics in African & African American Studies. 3 Hours.

Graduate level seminar with varied emphasis on topics relating to African & African American studies. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

AAST 5913. Independent Study in African and African American Studies. 3 Hours.

Graduate level independent study course with varied emphasis on topics relating to African and African American studies. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

AAST 6023. Destabilizing Queer Theory. 3 Hours.

Highlights constricted and racialized ways in which people generally visualize class, gender, race, and sexualities. Students will discuss the criticality of complex dynamics of visual politics in class, gender, race, and sexualities, and theoretical issues posed and negotiated by queer theory. (Typically offered: Irregular) This course is cross-listed with ARED 6023.

AAST 6963. Visualizing Critical Race Theory. 3 Hours.

An examination of critical theoretical approaches to the concepts of race and racism. Students will examine the ways in which these constructs perform a critical function in the construction of race(s) and racism(s) and their relevance to visual culture. (Typically offered: Fall and Spring) This course is cross-listed with PLSC 6963, ARED 6963.

Agricultural Economics (AGEC) Courses

AGEC 500V. Special Problems. 1-3 Hour.

Individual reading and investigation of a special problem in agricultural economics not available under regular courses, under the supervision of the graduate faculty. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

AGEC 5011. Seminar. 1 Hour.

Presentation and discussion of graduate student research. Formal presentations are made by all graduate students. Consideration given to research design, procedures, and presentation of results. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

AGEC 502V. Special Topics. 1-3 Hour.

Advanced studies of selected topics in agricultural economics not available in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

AGEC 503V. Internship in Agricultural Economics. 1-3 Hour.

On-the-job application of skills developed in the M.S. program. (Typically offered: Fall, Spring and Summer)

AGEC 5043. Agricultural Finance. 3 Hours.

(Formerly AGEC 4143.) Methods and procedures whereby agricultural firms acquire and utilize funds required for their successful operation. Emphasis is placed upon role of finance and financial planning and consideration is given to an understanding of financial firms serving agriculture. Graduate degree credit will not be given for both AGEC 4143 and AGEC 5043. Prerequisite: (AGEC 1103 or ECON 2023) and (AGEC 2103 or ECON 2013) and (AGEC 2142 or ACCT 2013). (Typically offered: Fall)

AGEC 5053. Advanced Farm Business Management. 3 Hours.

(Formerly AGEC 4403.) Principles and procedures of decision making as applied to the allocation of resources in the farm business for profit maximization. Emphasis is placed on use of principles of economics and their application to the decision making process. Includes exercises on the application of principles to specific farm management problems. Graduate degree credit will not be given for both AGEC 4403 and AGEC 5053. Prerequisite: AGEC 3403 and ASTM 2903 or equivalent. (Typically offered: Fall)

AGEC 5063. Agricultural and Rural Development. 3 Hours.

(Formerly AGEC 4163.) Examination of agricultural and rural development issues in less developed countries. Alternative agricultural production systems are compared, development theories examined, and consideration given to the planning and implementation of development programs. Graduate degree credit will not be given for both AGEC 4163 and AGEC 5063. Prerequisite: AGEC 1103 (or ECON 2023). (Typically offered: Fall)

AGEC 5073. Basis Trading: Applied Price Risk Management. 3 Hours.

(Formerly AGEC 4373.) This course provides students an opportunity to gain a detailed working knowledge of how basis trading concepts and practices are applied to agricultural markets and to develop a skill set that can be put immediately into practice in any basis trading operation. Graduate degree credit will not be given for both AGEC 4373 and AGEC 5073. Prerequisite: AGEC 3373 or consent of instructor. (Typically offered: Spring and Summer)

AGEC 5083. Basis Trading: Case Study. 3 Hours.

(Formerly AGEC 4383.) This course provides an opportunity to apply principles learned in AGEC 4373 to grain merchandising using the case study approach. The course will involve in-class meetings supplemented with faculty-directed group-based learning experiences involving professional grain merchandisers. Group activities will follow the traditional case study method. Graduate degree credit will not be given for both AGEC 4383 and AGEC 5083. Prerequisite: AGEC 4373 or AGEC 5073 (formerly AGEC 4373). (Typically offered: Fall)

AGEC 5103. Agricultural Microeconomics. 3 Hours.

Masters-level training in agricultural microeconomic theory and its application to food, agriculture and the environment. The course covers behavior of firms, households and markets, in more depth and rigor than encountered in undergraduate courses. Theories are explained and then applied to relevant food, agricultural, environment and resource issues. (Typically offered: Fall)

AGEC 5113. Agricultural Prices and Forecasting. 3 Hours.

(Formerly AGEC 4113.) Price theory and techniques for predicting price behavior of general economy and price behavior of individual agricultural products will be analyzed. Provides practice in the application of economics and statistics to agricultural price analysis. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both AGEC 4113 and AGEC 5113. Prerequisite: (AGEC 1103 or ECON 2023), AGEC 2403, (STAT 2303 or WCOB 1033) and MATH 2053. (Typically offered: Spring)

AGEC 5123. AgriBusiness Entrepreneurship. 3 Hours.

(Formerly AGEC 4323.) Agribusiness entrepreneurship is the process of bringing food or rural-based products and services from conceptualization to market. The course presents the opportunities, problems and constraints facing individuals and firms operating in rural or isolated markets while emphasizing the steps in conceptualization, development, marketing, and delivery-selling of agribusiness rural products. Graduate degree credit will not be given for both AGEC 4323 and AGEC 5123. Prerequisite: AGEC 1103 or equivalent. (Typically offered: Spring)

AGEC 5133. Agricultural and Environmental Resource Economics. 3 Hours.

An economic approach to problems of evaluating private and social benefits and costs of altering the environment. Emphasis given to the interaction of individuals, institutions, and technology in problems of establishing and maintaining an acceptable level of environmental quality. Prerequisite: Minimum of 3 hours Agricultural Economics or Economics at 3000 level or higher or PhD standing. (Typically offered: Spring)

AGEC 5143. Financial Management in Agriculture. 3 Hours.

Covers advanced topics in agricultural finance. The general focus of the course is the financial management of non-corporate firms. Covers the basic tools of financial analysis including financial arithmetic, asset evaluation under risk, and financial analysis and planning using econometric models. Such topics covered include management of current assets, capital budgeting, capital structure, and institutions involved in agricultural finance. Prerequisite: Graduate standing. (Typically offered: Fall)

AGEC 5153. The Economics of Public Policy. 3 Hours.

This class will examine the impact of public policy on agricultural and other business sectors as well as households and individuals, particular in rural areas. Emphasis will also be placed on analyzing the potential impact of future policy changes. The course will focus on the application of welfare criteria and economic analyses to the problems and policies affecting resource adjustments in agriculture and rural communities. Prerequisite: Graduate standing. (Typically offered: Spring)

AGEC 5203. Agribusiness Marketing Management. 3 Hours.

(Formerly AGECE 4303.) Marketing concepts will be developed and applied to the global food and fiber system. The course will use both commodity and product marketing principles and economic theory to analyze varied marketing situations. Case studies will be used to demonstrate the role that demand analysis and consumer behavior play in market management. Graduate degree credit will not be given for both AGECE 4303 and AGECE 5203. Prerequisite: AGECE 2303 and AGECE 3303. (Typically offered: Spring)

AGEC 5213. Agricultural Business Management. 3 Hours.

(Formerly AGECE 4313.) The planning, organizing, leading and controlling functions of management as they relate to agricultural business firms. Marketing of value-added products, budgeting, organizational structure, cost control, financial statements, capital budgeting and employee supervision and motivation. Case studies are used to teach communication and decision-making skills. Graduate degree credit will not be given for both AGECE 4313 and AGECE 5213. Prerequisite: (AGECE 2142 and AGECE 2141L) or (ACCT 2013 and AGECE 2303 or equivalent). (Typically offered: Fall)

AGEC 5223. International Agricultural Trade and Commercial Policy. 3 Hours.

(Formerly AGECE 4623.) Analysis of agricultural market competition and performance in a global economy. The impact of domestic and international agricultural policies on domestic and international markets and welfare. Economic principles applied to the interaction of economic events in the world food economy. Graduate degree credit will not be given for both AGECE 4623 and AGECE 5223. Prerequisite: (AGECE 1103 or ECON 2023) and (AGECE 2103 or ECON 2013). (Typically offered: Spring)

AGEC 5233. Political Economy of Agriculture and Food. 3 Hours.

(Formerly AGECE 4613.) Agricultural and food policies are studied from domestic and international perspectives. Laws, regulations, decisions and actions by governments and other institutions are examined in terms of rationale, content, and consequences. Economic and political frameworks are used to assess policies in terms competitive structure, operation, and performance of farming and food systems. Graduate degree credit will not be given for both AGECE 4613 and AGECE 5233. Prerequisite: (AGECE 1103 or ECON 2023) and (AGECE 2103 or ECON 2013) and (PSYC 2003 or SOCI 2013 or HDFS 2603). (Typically offered: Fall)

AGEC 5303. Agricultural Marketing Theory. 3 Hours.

Survey of the structure of agricultural product and factor markets including a critique of theoretical analyses of industry structure, conduct and performance; and a review of market structure research in agricultural industries. Prerequisite: Graduate standing. (Typically offered: Fall)

AGEC 5403. Quantitative Methods for Agribusiness. 3 Hours.

Application of quantitative techniques used to support managerial decision-making and resource allocation in agricultural firms. Provides exposure to mathematical and statistical tools (regression analysis, mathematical programming, simulation) used in economic analysis in agriculture. Emphasis is placed on computer applications with conceptual linkage to economic theory. Prerequisite: Graduate standing. (Typically offered: Fall)

AGEC 5413. Agribusiness Strategy. 3 Hours.

Addresses problems of strategy formulation in agribusiness emphasizing current problems and cases in agriculture. Surveys modern and classic perspectives on strategy with applications to agribusiness. Examines the development of firm level strategies within the structure and competitive environment of agricultural firms and industries. Prerequisite: Graduate standing. (Typically offered: Spring)

AGEC 5603. Food Economics and Health. 3 Hours.

This course provides an advanced overview of selected topics in food economics, food and nutrition policy and the interface between nutrition programs and health policy. Students will develop an understanding of economic and policy concepts of food, nutrition, and health. The course emphasizes analytical tools that can be applied to study issues in food, nutrition, and health facing the US and world populations. Prerequisite: Graduate standing. (Typically offered: Spring)

AGEC 5613. Econometrics. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. The single equation model is examined emphasizing multicollinearity, autocorrelation, heteroskedasticity, binary variables and distributed lags and model specification. Prerequisite: MATH 2043 and knowledge of matrix methods, (which may be acquired as a corequisite), and (AGECE 1103 or ECON 2023) and (AGECE 2403 or STAT 2303 or WCOB 1033). (Typically offered: Spring)

AGEC 5623. Quantitative Food and Agricultural Policy Analysis. 3 Hours.

Introduction to applied analysis of domestic and international food and agricultural policies using quantitative tools. This course will provide hands-on experience with simulation modeling in microeconomics. An emphasis is placed on policy analysis through computer applications with theoretical underpinnings. Corequisite: Lab component. Prerequisite: (AGECE 5103 and AGECE 5403) or instructor consent. (Typically offered: Spring)

AGEC 5713. Food Safety Law. 3 Hours.

This course provides students with an introduction to food law and policy, history of food regulation, the organization of federal food law and regulatory agencies, government inspection and enforcement powers, food safety standards, food labeling, food advertising and product liability. Web-based course. (Typically offered: Irregular)

AGEC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

AGEC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Agricultural Education (AGED) Courses

AGED 5001. Seminar. 1 Hour.

Presentations and discussion of graduate student research as well as review of current literature and topics of current interest by students and faculty. All graduate students will make at least one formal presentation. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

AGED 5013. Advanced Methods in Agricultural Mechanics. 3 Hours.

Emphasis on shop organization and management, courses of study, unit shop instruction, and development of skills in agricultural mechanics. (Typically offered: Summer Odd Years)

AGED 5053. Philosophy of Agricultural and Extension Education. 3 Hours.

An examination and analysis of social and economic events leading to the establishment and maintenance of federal, state, county, and local agricultural education programs. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Spring)

AGED 510V. Special Problems. 1-6 Hour.

Individual investigation of a special problem in agricultural education which is not available through regular courses. These will be directed by a member of the graduate faculty. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

AGED 5113. Undergraduate Researchers Improving Student Experiences. 3 Hours.

To engage students in the social sciences in action research that serves to solve a problem or answer a question within the student's academic field through scientific inquiry. All students will work with professionals, commonly outside of the university, within their discipline to conduct their action research in order to solve a problem experienced by that professional. Students may work in teams or individually to complete the overall purpose of the course. Prerequisite: AGED 5463 or HESC 5463 or other instructor approved Research Methods course. (Typically offered: Spring)

AGED 520V. Special Topics in Agricultural and Extension Education. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in agriculture education. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

AGED 5443. Principles of Technological Change. 3 Hours.

(Formerly AGED 4443.) This course introduces a structured approach for dealing with the organizational and human aspects of technology transition, including the key concepts of resistance and change management, organizational change, communications, and processes by which professional change agents influence the introduction, adoption, and diffusion of technological change. This course may be offered as a web-based course. Graduate degree credit will not be given for both AGED 4443 and AGED 5443. (Typically offered: Fall Odd Years)

AGED 5463. Research Methodology in the Social Sciences. 3 Hours.

Logical structure and the method of science. Basic elements of research design; observation, measurement, analytic method, interpretation, verification, presentation of results. Applications to research in economic or sociological problems of agriculture and human environmental sciences. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with HESC 5463.

AGED 5473. Interpreting Social Data in Agriculture. 3 Hours.

The development of competencies in analyzing, interpreting and reporting the results of analyses of social science data in agriculturally related professions. Students will select appropriate analysis techniques and procedures for various problems, analyze data, and interpret and report the results of statistical analyses in narrative and tabular form. (Typically offered: Fall)

AGED 5483. Technical Communication in the Social Sciences. 3 Hours.

This course will provide students with the basic principles and techniques in communicating social science information relevant to human subject research in agriculture, natural resources, and life sciences to the general public. Communication processes covered in the course include audience identification, writing, editing, and production of social science-based materials for popular and refereed publications. Focus will also be placed on thesis preparation and writing and research manuscript development and dissemination of social science research. Web delivered course. Prerequisite: Graduate standing. (Typically offered: Spring)

AGED 5493. Survey Design and Scale Development. 3 Hours.

This course is designed to provide the expertise required to design and conduct survey research. Students will understand the instruments (scales/questionnaire) used in data collection processes and acquire the statistical skills necessary to develop and test these survey instruments. This course uses both theory and practice. Hands-on training will be provided via SPSS package for data analyses, and Qualtrics will be used for web-based surveys. Prerequisite: 3 hours of graduate level statistics coursework and HESC 5463 or AGED 5463 or instructor consent. (Typically offered: Summer)

This course is cross-listed with HESC 5053.

AGED 5563. Thesis Proposal Development. 3 Hours.

The purpose of this course is to assist graduate students in the preparation of their thesis research proposal. Students will produce the first three chapters of their thesis by the end of the course. Prerequisite: AGED 5463 or HESC 5463. (Typically offered: Fall)

AGED 5632. Teaching Diverse Populations in Agricultural and Extension Education. 2 Hours.

(Formerly AGED 4632.) This course is designed to provide pre-service teachers of agriculture with an understanding of teaching diverse populations as applied to problems of practice in agricultural and extension education. Graduate degree credit will not be given for both AGED 4632 and AGED 5632. (Typically offered: Spring)

AGED 575V. Internship in Agricultural Education. 1-6 Hour.

Scheduled practical field experiences under supervision of a professional practitioner in off-campus secondary school systems. Emphasis includes classroom preparation, teaching, and student evaluation. (Typically offered: Fall, Spring and Summer)

AGED 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with FDSC 5993, HORT 5993.

AGED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Agricultural Statistics (AGST) Courses

AGST 500V. Special Problems. 1-6 Hour.

Individual investigation of a special problem in some area of statistics applicable to the agricultural, food, environmental, and life sciences not available under existing courses. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

AGST 5014. Experimental Design. 4 Hours.

Types of experimental designs, their analysis and application to agricultural research. Lecture 3 hours and laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: (AGST 5031 and AGST 5023) or STAT 5003. (Typically offered: Spring)

AGST 5023. Principles of Experimentation. 3 Hours.

Fundamental concepts of experimental and statistical methods as applied to agricultural research. Lecture 3 hours per week. (Typically offered: Fall, Spring and Summer)

AGST 5031. SAS Programming for Agricultural Sciences. 1 Hour.

An introduction to the SAS programming language with an emphasis on the reading and restructuring of data files, and the displaying of data in tabular and graphic forms. The course is taught using a hands-on approach. (Typically offered: Fall and Spring)

AGST 504V. Special Topics. 1-4 Hour.

Topics not covered in other courses or a broader-based study of specific topics in statistics and related areas. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

AGST 5713. Applied Regression Analysis for Agricultural Sciences. 3 Hours.

Analysis of agricultural experiments which contain quantitative factors through regression procedures. Lecture 3 hours per week. Prerequisite: (AGST 5031 and AGST 5023) or STAT 5003. (Typically offered: Fall)

Animal Science (ANSC) Courses

ANSC 500V. Special Problems. 1-6 Hour.

Work in special problems of animal industry. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANSC 5013. Domestic Animal Energetics. 3 Hours.

Physical, physiological and biochemical aspects of energy metabolism of domestic animals and their applications to livestock production. Lecture 3 hours per week.

Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

ANSC 5023. Legal Issues in Animal Agriculture. 3 Hours.

(Formerly ANSC 4123.) An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues.

The wide range of regulation- from local to state to federal, depending on the issue- will be studied and discussed. Graduate degree credit will not be given for both ANSC 4123 and ANSC 5023. (Typically offered: Spring Odd Years)

ANSC 5052. Cow-Calf Management. 2 Hours.

(Formerly ANSC 4252.) Systems of cow-calf management including the practical application of the principles of breeding, feeding, and management to commercial and purebred beef cattle under Arkansas conditions. Graduate degree credit will not be given for both ANSC 4252 and ANSC 5052. (Typically offered: Fall)

ANSC 510V. Special Topics in Animal Sciences. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in animal sciences. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

ANSC 5123. Advanced Animal Genetics. 3 Hours.

Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: ANSC 3123. (Typically offered: Fall Even Years)

This course is cross-listed with POSC 5123.

ANSC 5143. Biochemical Nutrition. 3 Hours.

Interrelationship of nutrition and physiological chemistry; structure and metabolism of physiological significant carbohydrates, lipids, and proteins; integration of metabolism with provision of tissue fuels; specie differences in regulatory control of tissue and whole body metabolism of nutrients. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

This course is cross-listed with POSC 5143.

ANSC 5152. Protein and Amino Acid Nutrition. 2 Hours.

Students will be introduced to the basic processes of protein digestion, amino acid absorption, transport, metabolism, and utilization along with how biochemical function of proteins and their dynamic state affect nutritional status for animals and man. Prerequisite: CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with POSC 5152.

ANSC 5163. Companion Animal Nutrition. 3 Hours.

This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities.

Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring)

This course is cross-listed with POSC 5163.

ANSC 5253. Advanced Livestock Production. 3 Hours.

Comprehensive review of recent advances in research relative to the various phases of livestock production. (Typically offered: Irregular)

ANSC 5262. Swine Production. 2 Hours.

(Formerly ANSC 4262.) Methods in producing purebred and commercial swine with specific emphasis on the management programs needed for profitable pork production in Arkansas. Graduate degree credit will not be given for both ANSC 4262 and ANSC 5262. (Typically offered: Fall Even Years)

ANSC 5272. Sheep Production. 2 Hours.

(Formerly ANSC 4272.) Purebred and commercial sheep management emphasizing the programs of major importance in lamb and wool production in Arkansas.

Graduate degree credit will not be given for both ANSC 4272 and ANSC 5272.

(Typically offered: Spring Odd Years)

ANSC 5283. Horse Production. 3 Hours.

(Formerly ANSC 4282.) Production, use and care of horses and ponies including breeding, feeding, handling, and management. Lecture 2 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both ANSC 4282 and ANSC 5283. Corequisite: Lab component. (Typically offered: Spring)

ANSC 5452. Milk Production. 2 Hours.

(Formerly ANSC 4452.) Principles of breeding, feeding, and management of dairy cattle will be studied. Graduate degree credit will not be given for both ANSC 4452 and ANSC 5452. (Typically offered: Spring)

ANSC 5482. Companion Animal Management. 2 Hours.

(Formerly ANSC 4482.) The study and application of principles of domestication, nutrition, reproduction, parasitology, diseases, behavior, and husbandry management to companion animals. Dogs, cats, and exotic animals will be the species of primary interest. Practical problems of care and management of these species will be solved. Graduate degree credit will not be given for both ANSC 4482 and ANSC 5482. Prerequisite: BIOL 1543 or equivalent or consent of instructor. (Typically offered: Fall)

ANSC 5553. Forage-Ruminant Relations. 3 Hours.

Advanced chemical, physical, and botanical characteristics of forage plants, the dynamics of grazing, intake and digestion, and techniques of measuring forage utilization and systems analysis at the plant-animal interface. Lecture 3 hours per week. CSES 1203 recommended. Corequisite: Lab component. Prerequisite: ANSC 3143. (Typically offered: Spring Odd Years)

This course is cross-listed with CSES 5553.

ANSC 5652. Stocker-Feedlot Cattle Management. 2 Hours.

(Formerly ANSC 4652.) Production and management systems for stocker and feed-lot cattle including practical applications of forage systems, feeding, health management and economics of production of these livestock. Graduate degree credit will not be given for both ANSC 4652 and ANSC 5652. (Typically offered: Spring)

ANSC 5662. Comparative Studies in Panamanian and US Agricultural Practices. 2 Hours.

An experiential-learning course with an embedded trip to Panama designed to give students an overview of the agricultural industry and the impact of Panamanian history, culture and geography on agriculture and how this contrasts with practices in the US. Students will participate in a study tour to Panama where they will engage in learning experiences that explore the agriculture, history, and culture of this country. They will have the opportunity to visit and learn from successful producers of livestock and agricultural staples as well as tour the Panama canal and learn about Panamanian culture and history. Prerequisite: Instructor consent and approval from Study Abroad office. (Typically offered: Spring)

ANSC 5743L. Advanced Analytical Methods in Animal Sciences Laboratory. 3 Hours.

Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. (Typically offered: Fall)

This course is cross-listed with POSC 5743L.

ANSC 5853. Advanced Meats Technology. 3 Hours.

An intensive study of processed meats, relating the science, technology, and quality of further processed meat and poultry products. Product development, sensory and chemical analysis, microbiology, nutritional aspects, and product labeling are covered. Prerequisite: POSC 4314 or ANSC 3613. (Typically offered: Spring Even Years)

ANSC 5901. Seminar. 1 Hour.

Critical review of the current scientific literature pertaining to the field of animal science. Oral reports. Lecture 1 hour per week. Prerequisite: Senior standing. (Typically offered: Fall)

ANSC 5923. Brain & Behavior. 3 Hours.

Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory systems and the autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with POSC 5923.

ANSC 5932. Cardiovascular Physiology of Domestic Animals. 2 Hours.

Cardiovascular physiology, including mechanisms of heart function and excitation, and blood vessel mechanisms associated with the circulatory system in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)

This course is cross-listed with POSC 5932.

ANSC 5942. Endocrine Physiology of Domestic Animals. 2 Hours.

Endocrine physiology, including mechanisms of hormone secretion, function, and regulation. Mechanisms associated with the endocrine system will be discussed for domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (or first 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)

This course is cross-listed with POSC 5942.

ANSC 5952. Respiratory Physiology of Domestic Animals. 2 Hours.

Respiratory physiology, including mechanisms of lung function and gas exchange. Mechanisms associated with the interaction of the respiratory system with other bodily systems in domestic animals and poultry will be discussed. Lecture 3 hours; drill 1 hour per week for first 8 weeks of semester. Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Spring)

This course is cross-listed with POSC 5952.

ANSC 5962. Gastrointestinal/Digestive Physiology of Domestic Animals. 2 Hours.

Gastrointestinal and hepatic physiology, including mechanisms of digestion, absorption of nutrients with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Fall)

This course is cross-listed with POSC 5962.

ANSC 5972. Renal Physiology. 2 Hours.

Renal physiology, including mechanisms of renal clearance with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: POSC 3033 or ANSC 3033. (Typically offered: Spring)

This course is cross-listed with POSC 5972.

ANSC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ANSC 6123. Advanced Food Animal Wellbeing. 3 Hours.

Advances in fundamentals of animal welfare including animal health, animal handling, food safety and productivity. Prerequisite: Instructor consent. (Typically offered: Spring)

This course is cross-listed with POSC 6123.

ANSC 6143. Minerals in Animal Nutrition. 3 Hours.

Mineral nutrients, their sources and functions, as related to nutrition of domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Fall; Spring Even Years)

ANSC 6243. Ruminant Nutrition. 3 Hours.

Anatomy and physiology of the rumen. The nutrient requirements of microbial organisms and the relation of microbial digestion in the rumen to the nutrition of cattle, sheep and other ruminants. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

ANSC 6343. Vitamin Nutrition in Domestic Animals. 3 Hours.

The vitamins required by domestic animals with emphasis upon their role in animal nutrition, physiological functions, and consequences of failure to meet the requirement of the animal. Lecture 3 hours per week. Prerequisite: ANSC 3143 (or POSC 4343) and CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with POSC 6343.

ANSC 6833. Reproduction in Domestic Animals. 3 Hours.

Comprehensive review of current theory of reproductive function in domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3433. (Typically offered: Spring Even Years)

ANSC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Anthropology (ANTH) Courses

ANTH 500V. Advanced Problems in Anthropology. 1-18 Hour.

Individual research at graduate level on clearly defined problems or problem areas. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

ANTH 5053. Quaternary Environments. 3 Hours.

An interdisciplinary study of the Quaternary Period including dating methods, deposits, soils, climates, tectonics, and human adaptation. Lecture 2 hours, laboratory 2 hours per week. (Typically offered: Fall)

This course is cross-listed with ENDY 5053, GEOS 5053.

ANTH 5063. Popular Culture. 3 Hours.

(Formerly ANTH 4033.) Study of national and international varieties of popular culture, including music, dance, fashion, and the media. Emphasis will be given to both ethnographic approaches, which focus on the investigation of production and consumption of cultural forms and to cultural studies approaches, which see culture as a terrain of struggle. Graduate degree credit will not be given for both ANTH 4033 and ANTH 5063. (Typically offered: Irregular)

ANTH 5093. The Archeology of Death. 3 Hours.

(Formerly ANTH 4093.) Study of the analysis and interpretation of archeological mortuary remains and sites. Key archeological and anthropological sources that have influenced major theoretical developments are reviewed. Graduate degree credit will not be given for both ANTH 4093 and ANTH 5093. (Typically offered: Irregular)

ANTH 5103. Applications of Cultural Method and Theory. 3 Hours.

Review of the nature and history of cultural anthropology; recent theories and practical implications and applications of various methods of acquiring, analyzing and interpreting cultural anthropological data. (Typically offered: Fall)

ANTH 5113. Anthropology of the City. 3 Hours.

Examines cities as both products of culture, and sites where culture is made and received. Explores the implications of several pivotal urban and cultural trends and the way in which representations of the city have informed dominant ideas about city space, function, and feel. (Typically offered: Irregular)

ANTH 5133. Settlement Archaeology. 3 Hours.

(Formerly ANTH 4133.) Focuses on the historical development of settlement archeology, the methods of site survey and discovery within regions, ecological and social theories that underlie patterns of human land use and distribution, methods of site location analysis, and descriptive and predictive site location modeling. Graduate degree credit will not be given for both ANTH 4133 and ANTH 5133. (Typically offered: Irregular)

ANTH 5143. Ecological Anthropology. 3 Hours.

(Formerly ANTH 4143.) Anthropological perspectives on the study of relationships among human populations and their ecosystems. Graduate degree credit will not be given for both ANTH 4143 and ANTH 5143. (Typically offered: Irregular)

ANTH 5153. Topics in Anthropology. 3 Hours.

Graduate level seminar with varied emphasis on topics relating to cultural anthropology. (Typically offered: Irregular) May be repeated for degree credit.

ANTH 5203. Applications of Archeological Method and Theory. 3 Hours.

Review of the nature and history of archeology; recent theories and practical implications and applications of various methods of acquiring, analyzing, and interpreting archeological data. (Typically offered: Fall)

ANTH 5243. Archeology of the Midsouth. 3 Hours.

(Formerly ANTH 4243.) Survey of prehistoric and protohistoric cultures of the lower Mississippi Valley and adjacent regions. Graduate degree credit will not be given for both ANTH 4243 and ANTH 5243. (Typically offered: Irregular)

ANTH 5256. Archeological Field Session. 6 Hours.

(Formerly ANTH 4256.) Practical field and laboratory experiences in archeological research. Graduate degree credit will not be given for both ANTH 4256 and ANTH 5256. (Typically offered: Summer)

ANTH 5263. Indians of Arkansas and the South. 3 Hours.

Study of the traditional lifeways and prehistoric backgrounds of Indians living in the southern United States, including Arkansas. (Typically offered: Spring Odd Years)

ANTH 5273. Photography for Fieldwork. 3 Hours.

(Formerly ANTH 4273.) This class explores the use of photographic images as both data and representational tools in anthropological research, emphasizing the ethical, theoretical, and methodological issues involved. Graduate degree credit will not be given for both ANTH 4273 and ANTH 5273. (Typically offered: Irregular)

ANTH 5283. Survey in Ethnographic Film. 3 Hours.

(Formerly ANTH 4283.) Survey of the development and evolution of ethnographic film, based on class screenings to build familiarity, vocabulary, and literacy with this branch of visual anthropology. Graduate degree credit will not be given for both ANTH 4283 and ANTH 5283. (Typically offered: Irregular)

ANTH 5293. Identity and Culture in the U.S.-Mexico Borderlands. 3 Hours.

(Formerly ANTH 4263.) An exploration of the interplay between Latino/a, Mexican, Anglo, and Native American identities and cultures along the U.S.-Mexico border. Course examines identity formation, hybridity, social tension, marginalization, race and gender, from an anthropological perspective, paying special attention to the border as theoretical construct as well as material reality. Graduate degree credit will not be given for both ANTH 4263 and ANTH 5293. (Typically offered: Irregular)

ANTH 5303. Applications of Method and Theory in Biological Anthropology. 3 Hours.

Review of the nature and history of biological anthropology; recent theories and the practical implications and applications of various methods of acquiring, analyzing, and interpreting data. (Typically offered: Irregular)

ANTH 5313. Laboratory Methods in Archeology. 3 Hours.

(Formerly ANTH 4353.) Theory and practice of describing, analyzing, and reporting upon archeological materials. Graduate degree credit will not be given for both ANTH 4353 and ANTH 5313. (Typically offered: Irregular)

ANTH 5363. Museums, Material Culture, and Popular Imagination. 3 Hours.

(Formerly ANTH 4363.) Museums as ideological sites and thus as sites of potential contestation produce cultural and moral systems that legitimate existing social orders. This course will focus on strategies of representation and the continuous process of negotiating social and cultural hierarchies with and through objects that are displayed. Graduate degree credit will not be given for both ANTH 4363 and ANTH 5363. (Typically offered: Fall)

ANTH 5413. Bioarcheology Seminar. 3 Hours.

Intensive coverage of bioarcheological method and theory with the context of both academic and cultural resources management research. (Typically offered: Spring Odd Years)

ANTH 5443. Cultural Resource Management I. 3 Hours.

Concentrated discussion of management problems relative to cultural resources, including review and interpretation of relevant federal legislation, research vs. planning needs, public involvement and sponsor planning, and assessment of resources relative to scientific needs. No field training involved; discussion will deal only with administrative, legal, and scientific management problems. (Typically offered: Irregular)

ANTH 5473. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall) This course is cross-listed with WLLC 5463, ENGL 5463.

ANTH 548V. Individual Study of Anthropology. 1-6 Hour.

(Formerly ANTH 448V.) Reading course for advanced students with special interests in anthropology. Graduate degree credit will not be given for both ANTH 448V and ANTH 548V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ANTH 5513. African Religions: Gods, Witches, Ancestors. 3 Hours.

(Formerly ANTH 4513.) An exploration of African religions from a variety of anthropological perspectives, exploring how religious experience is perceived and interpreted by adherents, highlighting the way in which individual and group identities are constructed, maintained and contested within religious contexts. Readings reflect the vast diversity of religious life in Africa. Graduate degree credit will not be given for both ANTH 4513 and ANTH 5513. (Typically offered: Irregular)

ANTH 5523. Dental Science. 3 Hours.

(Formerly ANTH 4523.) Introduction to the study of the human dentition including its anatomy, morphology, growth and development, and histology. Graduate degree credit will not be given for both ANTH 4523 and ANTH 5523. (Typically offered: Fall)

ANTH 5553. Introduction to Raster GIS. 3 Hours.

(Formerly ANTH 4553.) Theory, data structures, algorithms, and techniques behind raster-based geographical information systems. Through laboratory exercises and lectures multidisciplinary applications are examined in database creation, remotely sensed data handling, elevation models, and resource models using boolean, map algebra, and other methods. Credit will not be given for both ANTH 4553 and ANTH 5553. (Typically offered: Fall)

This course is cross-listed with GEOS 5453.

ANTH 5563. Vector GIS. 3 Hours.

(Formerly ANTH 4563.) Introduction to geographic information systems (GIS) applications in marketing, transportation, real estate, demographics, urban and regional planning, and related areas. Lectures focus on development of principles, paralleled by workstation-based laboratory exercises using mainstream GIS software and relational databases. Credit will not be given for both ANTH 4563 and ANTH 5563. (Typically offered: Spring)

This course is cross-listed with GEOS 5583.

ANTH 5583. Cultures of Africa. 3 Hours.

An exploration of the people and places of Africa from a variety of anthropological perspectives. Classic and contemporary works will be studied in order to underscore the unity and diversity of African cultures, as well as the importance African societies have played in helping us understand culture/society throughout the world. (Typically offered: Fall)

ANTH 5593. Introduction to Global Positioning Systems and Global Navigation Satellite Systems. 3 Hours.

(Formerly ANTH 4593.) Introduction to navigation, georeferencing, and digital data collection using GPS and GNSS receivers, data loggers, and laser technology. Components of NavStar GLONASS, Beidou and other global positioning system are used in integration of digital information into various GIS platforms with emphasis on practical applications. Credit will not be given for both ANTH 4593 and ANTH 5593. (Typically offered: Spring)

This course is cross-listed with GEOS 5293.

ANTH 5603. Landscape Archaeology. 3 Hours.

(Formerly ANTH 4603.) This course provides an introduction to the methods and theories of landscape archaeology. Topics include archaeological survey techniques, environmental and social processes recorded in the archaeological landscape, and analysis of ancient settlement and land use data to reveal changes in population, resource utilization, and environmental relationships. Credit will not be given for both ANTH 4603 and ANTH 5603. (Typically offered: Fall)

ANTH 561V. Field Research in Archeology. 1-6 Hour.

Directed graduate level archeological fieldwork. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ANTH 5623. Primate Adaptation and Evolution. 3 Hours.

(Formerly ANTH 4613.) Introduction to the biology of the order of Primates. This course considers the comparative anatomy, behavioral ecology and paleontology of our nearest living relatives. Credit will not be given for both ANTH 4613 and ANTH 5623. (Typically offered: Spring)

This course is cross-listed with BIOL 5613.

ANTH 5633. Archeological Prospecting & Remote Sensing. 3 Hours.

(Formerly ANTH 4633.) Ground-based geophysical, aerial, and other remote sensing methods are examined for detecting, mapping, and understanding archeological and other deposits. These methods include magnetometry, resistivity, conductivity, radar, aerial photography, thermography, and multispectral scanning. Requires computer skills, field trips, and use of instruments. Credit will not be given for both ANTH 4633 and ANTH 5633. (Typically offered: Irregular)

ANTH 5653. GIS Analysis and Modeling. 3 Hours.

(Formerly ANTH 4653.) Unlike conventional GIS courses that focus on studying 'where', this course will teach students to address beyond 'where' using various GIS analysis and modeling techniques to explore 'why' and 'how'. The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. Credit will not be given for both ANTH 4653 and ANTH 5653. (Typically offered: Spring)

This course is cross-listed with GEOS 5653, ENDY 5043.

ANTH 5703. Mammalian Evolution and Osteology. 3 Hours.

(Formerly ANTH 4703.) This course will focus on describing the evolutionary history of mammals, a group of vertebrates that include over 5,000 species in 29 orders, and will provide an overview of living species and their identifying features. Credit will not be given for both ANTH 4703 and ANTH 5703. Prerequisite: ANTH 1013 and ANTH 1011L, BIOL 1543 and BIOL 1541L, or instructor consent. (Typically offered: Irregular)

This course is cross-listed with BIOL 5883.

ANTH 5803. Historical Archeology. 3 Hours.

(Formerly ANTH 4803.) Review of the development of historical archeology and discussion of contemporary theory, methods, and substantive issues. Lab sessions on historic artifact identification and analysis. Graduate degree credit will not be given for both ANTH 4803 and ANTH 5803. (Typically offered: Irregular)

ANTH 5813. Ethnographic Approaches to the Past. 3 Hours.

(Formerly ANTH 4813.) Review of the uses of ethnographic data in the reconstruction and interpretation of past cultures and cultural processes, with particular emphasis on the relationships between modern theories of culture and archeological interpretation. Credit will not be given for both ANTH 4813 and ANTH 5813. (Typically offered: Irregular)

ANTH 582V. Applied Visual Research. 1-6 Hour.

(Formerly ANTH 482V.) This class provides hands-on skill and training conducting visually informed fieldwork designed to help represent unique cultural settings, experience, and heritage. Credit will not be given for both ANTH 482V and ANTH 582V. (Typically offered: Irregular)

ANTH 5863. Quantitative Anthropology. 3 Hours.

(Formerly ANTH 4863.) Introductory statistics course for anthropology students examines probability theory, nature of anthropological data, data graphics, descriptive statistics, probability distributions, test for means and variances, categorical and rank methods, ANOVA, correlation and regression. Lectures focus on theory methods; utilize anthropological data and a statistical software laboratory. Credit will not be given for both ANTH 4863 and ANTH 5863. (Typically offered: Irregular)

This course is cross-listed with GEOS 5863.

ANTH 5903. Seminar in Anthropology. 3 Hours.

(Formerly ANTH 4903.) Research, discussion, and projects focusing on a variety of topics. Credit will not be given for both ANTH 4903 and ANTH 5903. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ANTH 5913. Topics of the Middle East. 3 Hours.

(Formerly ANTH 4913.) Covers a special topic or issue. Credit will not be given for both ANTH 4913 and ANTH 5913. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ANTH 6033. Society and Environment. 3 Hours.

This course examines the complex interrelationships between human societies and the natural environment. Drawing on diverse and interdisciplinary perspectives in archaeology, ethnography, history, geography, and palaeo-environmental studies, readings and discussion will explore the co-production of social and environmental systems over time. (Typically offered: Spring) May be repeated for degree credit. This course is cross-listed with ENDY 6033.

ANTH 610V. Internship. 1-18 Hour.

Internship. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

ANTH 6813. Seminar: Cultural Anthropology. 3 Hours.

Variable topics in Anthropology will be explored in depth. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 6823. Seminar: Archeology. 3 Hours.

Various topics in Archeology will be explored in depth. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 6833. Seminar: Biological Anthropology. 3 Hours.

Various topics in Biological Anthropology will be explored in depth. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ANTH 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall and Spring) May be repeated for degree credit.

Apparel Merchandising and Product Development (AMPD) Courses

AMPD 5003. Apparel Sourcing and Merchandising Systems in the Global Economy. 3 Hours.

Evaluation of key issues facing textiles and apparel supply chain businesses in the global economy considering economic, political, and social perspectives and professional implications. Lecture 3 hours. (Typically offered: Fall Odd Years)

AMPD 5023. Social, Psychological and Cultural Aspects of Dress. 3 Hours.

Integration of social, psychological and cultural theories as they apply to appearance and clothing behavior. Lecture 3 hours. (Typically offered: Fall Odd Years)

AMPD 5033. Issues and Trends in Textile Studies. 3 Hours.

Studies of advances in textile science and recent developments in the textile industry. Lecture 3 hours. (Typically offered: Spring Odd Years)

AMPD 5043. Theories and Practices in Apparel Merchandising. 3 Hours.

Theoretical perspectives, concepts and current practices that influence apparel merchandising. Lecture 3 hours. (Typically offered: Spring Even Years)

AMPD 5063. Advanced Apparel Production. 3 Hours.

(Formerly AMPD 4063.) An advanced study of product development incorporating technology used in the industry for a career in fashion merchandising and/or product development in a computer laboratory environment. Laboratory 6 hours per week. Graduate degree credit will not be given for both AMPD 4063 and AMPD 5063. Prerequisite: AMPD 2033, AMPD 2063 and AMPD 3003. (Typically offered: Fall and Spring)

AMPD 5093. Apparel Merchandise Planning and Inventory Control. 3 Hours.

(Formerly AMPD 4093.) Describes today's challenges for both apparel manufacturers and retailers in meeting the consumer's demands for the right products at the right prices - and at the right times. Follows the evolution of the merchandising function with emphasis on production efficiency, highlighting the philosophies of industry executives and the effective integration of the merchandising, store design, marketing, the apparel supply chain and manufacturing functions along the way. Graduate degree credit will not be given for both AMPD 4093 and AMPD 5093. Prerequisite: AMPD 3033. (Typically offered: Fall and Spring)

AMPD 5103. Evolution of Fashion and Society Through Television Media. 3 Hours.

(Formerly AMPD 4103.) This course uses television programming from its early beginnings in the 1930s through to the twenty-first century to trace major events, societal changes, and the associated evolution of fashion. The course examines television both as an innovator and diffuser of fashion trends. Graduate degree credit will not be given for both AMPD 4103 and AMPD 5103. (Typically offered: Fall and Spring)

AMPD 5111. History of Apparel Through Film from 1900 to Present. 1 Hour.

(Formerly AMPD 4111.) This course uses historic costume films to trace the evolution of clothing from 1900 to Present. Emphasis is placed on societal aspects such as politics, religion, economy, technology, education, sports, class structure, and gender roles, and how they affect and change dress. Web based course. Graduate degree credit will not be given for both AMPD 4111 and AMPD 5111. (Typically offered: Fall and Spring)

AMPD 5211. History of Apparel Through Film to 1900. 1 Hour.

(Formerly AMPD 4011.) This course uses historic costume films to trace the evolution of clothing from ancient Egypt to the Twentieth Century. Emphasis is placed on societal aspects such as politics, religion, economy, technology, education, sports, class structure, and gender roles, and how they affect and change dress. Web-based course. Graduate degree credit will not be given for both AMPD 4011 and AMPD 5211. (Typically offered: Fall and Spring)

AMPD 5223. Merchandising Application for the Apparel Industry. 3 Hours.

(Formerly AMPD 4023.) Application of merchandising theory, principles and practices in a capstone class. An in depth study of innovative apparel business concepts as applied to manufacturers and retailers of apparel including apparel classification, seasonal cycles, stock emphasis, assortment strategies, target customers, and apparel trends. Includes an overview of marketing communication including advertising, personal selling, and sales promotion. Graduate degree credit will not be given for both AMPD 4023 and AMPD 5223. Prerequisite: AMPD 3033 and AMPD 3043. (Typically offered: Fall and Spring)

AMPD 5233L. Computer Aided Textile Design. 3 Hours.

(Formerly AMPD 4033.) This course is designed to give students advanced skills in textile design using industry based computer aided design (CAD) software. Lab 4 hours per week. Graduate degree credit will not be given for both AMPD 4033L and AMPD 5233L. Prerequisite: AMPD 2033 and AMPD 2053. (Typically offered: Fall and Spring)

AMPD 5253. Historic and Contemporary Apparel. 3 Hours.

(Formerly AMPD 4053.) This course traces the evolution of clothing from ancient times to the twentieth century with emphasis upon Western civilization and includes the study of contemporary fashion as a social force including the origin, scope, theory, and history of the fashion business, the materials of fashion, the fashion producers, auxiliary fashion enterprises, designers, fashion leaders, and leading market. Cultural and economic factors affecting dress, adornment and customs associated dress will be stressed. The Lecture 3 hours per week. Graduate degree credit will not be given for both AMPD 4053 and AMPD 5253. (Typically offered: Fall and Spring)

AMPD 5901. AMPD Pre-Study Tour. 1 Hour.

(Formerly AMPD 4901.) A study of specific regional and international fashion markets for apparel studies in preparation for AMPD 591V AMPD Study Tour. The course examines the design, production, distribution and retailing of fashion goods from couture fashion to mass markets. AMPD 5901 is content specific to each AMPD 591V study tour and must be repeated for each study tour destination. A grade of 'C' or better is required to participate in AMPD 591V. Graduate degree credit will not be given for both AMPD 4901 and AMPD 5901. Prerequisite: 2.0 minimum GPA. AMPD majors with minimum 30 hours, or consent. (Typically offered: Spring and Summer) May be repeated for up to 4 hours of degree credit.

AMPD 591V. AMPD Study Tour. 2-6 Hour.

(Formerly AMPD 491V.) An on-site study of specific regional and international fashion markets for apparel merchandising and product development. Course further examines the design, production, distribution and retailing of fashion goods from couture fashion to mass markets as outlined in AMPD 4901. Course includes study trip; length based upon destination. Additional fees required. Course will also be offered each May and August Intersession. Graduate degree credit will not be given for both AMPD 491V and AMPD 591V. Prerequisite: AMPD 4901 (with a C or better), 2.0 min. GPA, AMPD major with min. 30 hours, and instructor consent. Corequisite: AMPD 4901 (with a C or better, if corequisite, must have C or better at time of trip), 2.0 min. GPA, AMPD major with min. 30 hours, and instructor consent. (Typically offered: Summer) May be repeated for up to 24 hours of degree credit.

Applied Music (Class) (MUAC)

Courses

MUAC 5371. Teaching the High School Percussionist. 1 Hour.

(Formerly MUAC 4371.) A study of solo literature and small and large ensemble literature appropriate for the high school percussionist. Emphasis on advanced snare drum and marimba lit., timpani and the broad range of percussionist instruments. Includes study of high school band, orchestra and percussion ensemble scores. Graduate degree credit will not be given for both MUAC 4371 and MUAC 5371. Prerequisite: MUED 1371. (Typically offered: Irregular)

MUAC 5421. Advanced Studies in Improvisation. 1 Hour.

Extends the techniques built in the improvisation course sequence (MUAC 3401, MUAC 3411, MUAC 4401, MUAC 4411) with specialized topics in a variety of improvisatory traditions. Sections may include 'Free Jazz', 'Coltrane and Chromaticism', 'Atonal Improvisation', 'Baroque Improvisation' and 'World Music Improvisation'. Prerequisite: Instructor consent. (Typically offered: Irregular) May be repeated for up to 2 hours of degree credit.

Applied Music (Private Instruction) (MUAP)

Courses

MUAP 500V. Applied Voice/Instrument-Secondary Level. 1-2 Hour.

Private study at the graduate secondary level. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUAP 510V. Applied Voice/Instrument. 1-5 Hour.

Private study at the graduate level. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUAP 5201. Graduate Recital I. 1 Hour.

Preparation and performance of a public recital of a minimum of 50 minutes of music. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUAP 5211. Graduate Recital II. 1 Hour.

Preparation and performance of a public recital of a minimum of 50 minutes of music. (Typically offered: Fall and Spring) May be repeated for degree credit.

Arabic (ARAB)

Courses

ARAB 570V. Special Topics. 1-6 Hour.

(Formerly ARAB 470V.) May be offered in a topic not specifically covered by courses otherwise listed. Graduate degree credit will not be given for both ARAB 470V and ARAB 570V. (Typically offered: Irregular) May be repeated for degree credit.

Art (ARTS)

Courses

ARTS 5023. Figure Drawing II. 3 Hours.

(Formerly ARTS 4023.) Advanced study of the figure with emphasis on figure structure and its relationship to pictorial form in drawing. Graduate degree credit will not be given for both ARTS 4023 and ARTS 5023. (Typically offered: Irregular)

ARTS 5513. Technical Ceramics. 3 Hours.

(Formerly ARTS 4513.) Advanced study of ceramic materials and processes. Clay composition, clay body formulation and analysis, glaze composition and formulation, firing methods (low, mid, and high-temperature gas, electric and atmospheric firings), and kiln design will be covered in depth. Graduate degree credit will not be given for both ARTS 4513 and ARTS 5513. Prerequisite: ARTS 4503. (Typically offered: Irregular)

ARTS 5723. Experiments in Moving Image I. 3 Hours.

An introduction to experimental video art, providing a theoretical and practical foundation for creating video for installation, performance or screen, set within a context of historical and contemporary video art and experimental film. Students will complete assignments creating new, original moving image works. (Typically offered: Fall and Spring)

ARTS 5783. Critical Issues in Experimental Media Art. 3 Hours.

Explores a variety of contemporary critical issues and methodologies in Experimental Media Art, while building a deeper theoretical and practical understanding of creating for the twenty-first century. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARTS 5813. Digital Photography. 3 Hours.

(Formerly ARTS 4813.) Introduction to digital photography production, techniques and theory. Digital input from scanning (flatbed & slide/negative), digital cameras, video and internet sources. Computer assisted manipulation of imagery for correction and abstraction. Output to a digital printing systems, analog systems (film recorder), servers and Internet. Graduate degree credit will not be given for both ARTS 4813 and ARTS 5813. Prerequisite: ARTS 3803. (Typically offered: Fall and Spring)

ARTS 5833. Advanced Black and White Photography. 3 Hours.

(Formerly ARTS 4833.) Advanced black and white theory, practice and techniques including: Zone System, large format camera and studio lighting. Graduate degree credit will not be given for both ARTS 4833 and ARTS 5833. Prerequisite: ARTS 3803. (Typically offered: Irregular)

ARTS 584V. Special Problems in Photography. 1-6 Hour.

(Formerly ARTS 484V.) Individual instruction for advanced undergraduates and graduate students. Special projects in photography designated by students in collaboration with faculty. Graduate degree credit will not be given for both ARTS 484V and ARTS 584V. Prerequisite: ARTS 3803 and (ARTS 3813 or ARTS 4823 or ARTS 4833). (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ARTS 5883. Bookmaking. 3 Hours.

(Formerly ARTS 5883.) Introduction to the creation of unique, limited edition artist's bookworks -- with emphasis on technical knowledge and conceptual understanding of the book form as a means of artistic expression. Graduate degree credit will not be given for both ARTS 4883 and ARTS 5883. (Typically offered: Irregular) This course is equivalent to ARTS 4883.

ARTS 5913. Graduate Seminar in Studio Art. 3 Hours.

Special seminars at the graduate level in Studio Art. Subject matter changes depending on student interest and faculty expertise. Prerequisite: Admission to MFA program. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARTS 5923. MFA First Year Seminar. 3 Hours.

Introduction to graduate level study in art, including pedagogy related to teaching art at the college level. Topics to be covered include: development of research interests, critical thinking within studio practice, situating work in the contemporary context, expectations at the graduate level, and an introduction to techniques and theories of studio art education. Prerequisite: Admission to MFA program. (Typically offered: Fall)

ARTS 5933. MFA Second Year Seminar. 3 Hours.

Preparation for a professional art practice. Examination of theoretical and practical aspects of career development for contemporary artists. Prerequisite: ARTS 5923. (Typically offered: Fall)

ARTS 596V. Fine Arts Gallery Internship. 1-3 Hour.

(Formerly ARTS 493V.) Study all aspects of operating the Fine Arts Gallery. Research and preparation for exhibitions, organize and install exhibits, care of art works, create and distribute publicity, arrange interviews with newspapers, and other media. Graduate degree credit will not be given for both ARTS 493V and ARTS 596V. (Typically offered: Fall, Spring and Summer)

ARTS 601V. Master of Fine Arts Exhibition. 1-6 Hour.

Production and presentation of a one person exhibition of art work. The M.F.A. candidate will be responsible for making three acceptable slide sets of the exhibition and exhibition statements. Prerequisite: M.F.A. candidacy. (Typically offered: Fall, Spring and Summer)

ARTS 602V. Graduate Drawing. 1-6 Hour.

Individual problems in drawing techniques. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

ARTS 6033. Graduate Drawing Studio. 3 Hours.

Intensive studio practice in drawing combined with reading, writing, and discussion of relevant contemporary issues in the fields of painting and drawing. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 612V. Graduate Painting. 1-6 Hour.

Individual problems in painting techniques. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6133. Graduate Painting Studio. 3 Hours.

Intensive studio practice in painting combined with reading, writing, and discussion of relevant contemporary issues in the fields of painting and drawing. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 622V. Graduate Sculpture. 1-6 Hour.

Individual problems in sculpture techniques. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

ARTS 6233. Graduate Sculpture Studio. 3 Hours.

Intensive studio practice in sculpture combined with reading, writing, and discussion of relevant contemporary issues in the field of sculpture and new media. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 642V. Graduate Printmaking. 1-6 Hour.

Individual problems in printmaking techniques. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6433. Graduate Printmaking Studio. 3 Hours.

Intensive studio practice in printmaking combined with reading, writing, and discussion of relevant contemporary issues in the fields of printmaking. Includes regular critiques, both with the group and in individual consultations with the instructor. Prerequisite: Admission to MFA program in Studio Art. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

ARTS 652V. Graduate Ceramics. 1-6 Hour.

Individual problems in ceramic techniques. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6533. Graduate Ceramics Studio. 3 Hours.

Discussion of contemporary ceramics issues in tandem with the development of a cohesive body of work. Students lead their own explorations, technically and conceptually, while working toward a professional standard of output. Includes regular critiques, with the class and individually with the instructor. Any ceramic processes may be used. Prerequisite: MFA Studio Art Graduate Standing. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 682V. Graduate Photography. 1-6 Hour.

Individual problems in photography. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ARTS 6833. Graduate Photography Studio. 3 Hours.

Intensive studio practice with reading and discussion of contemporary issues in photography for MFA students. Prerequisite: Admission to MFA program in Art. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

ARTS 695V. Special Topics. 1-6 Hour.

Subject matter not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

Art Education (ARED) Courses

ARED 5003. Research Methodologies in Art Education. 3 Hours.

An overview of mixed research methodologies employed in the field of art education. Covers foundational knowledge and skills necessary for conducting research in education and related fields. (Typically offered: Fall)

ARED 5013. (Dis)Mantling Diversity & Pedagogy. 3 Hours.

Covers teaching strategies that deconstruct disabling, systemic, social constructions and explore how people are using comics, films, and other popular media to discuss/expose issues of race, class, gender, sexuality, and gender identity, trauma, disease, and disability. (Typically offered: Spring)

ARED 5953. Special Topics in Art Education. 3 Hours.

(Formerly ARED 4953.) Art education topics not included in regularly offered courses. Graduate degree credit will not be given for both ARED 4953 and ARED 5953. Pre- or Corequisite: ARED 3613. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ARED 6003. Foundations and Histories of Art Education. 3 Hours.

Examines classic theories in art education and their relevance to current developments in the field. Develop and conduct historical research projects, respond to writings on histories of art education, and explore how art education histories are represented. (Typically offered: Fall)

ARED 6013. Community-Based Art Education. 3 Hours.

Provides an overview of current and historical art education programs in the community. Introduces foundational knowledge and skills necessary for funding support, development, and implementation. Focuses on intergenerational and collaborative cross-disciplinary programs, their significance, and implications. (Typically offered: Irregular)

ARED 6023. Destabilizing Queer Theory. 3 Hours.

Highlights constricted and racialized ways in which people generally visualize class, gender, race, and sexualities. Students will discuss the criticality of complex dynamics of visual politics in class, gender, race, and sexualities, and theoretical issues posed and negotiated by queer theory. (Typically offered: Irregular)
This course is cross-listed with AAST 6023.

ARED 6033. Transnational Feminist Perspectives in Art and Education. 3 Hours.

Explores transnational feminist frameworks aimed at investigation and women's activism. Focuses on how artists, educators, activists, and makers employ various artistic interventions to build transnational solidarities against global injustices. (Typically offered: Irregular)

ARED 6043. Art, Play, and Aesthetics in Childhood. 3 Hours.

Provides a comprehensive review of research and theory related to the study and practice of art, play and aesthetics in childhood, with specific attention given to contemporary research that extends, critiques, and exists alongside earlier understandings of how and why these practices matter to childhood. (Typically offered: Irregular)

ARED 6053. Disability Studies in Art Education. 3 Hours.

An overview of the current issues and practices related to disability studies and application in art education. Involves readings, observations, reflections, discussion, and extensive experience applying art curriculum and contemporary pedagogy to inclusive art education practice with disabled adults 18 years and older at a community-based setting. (Typically offered: Irregular)

ARED 6063. Curriculum Theories: Art Education. 3 Hours.

Examines, explores, and applies theory and research to curriculum and pedagogy. These curricular theories are situated both in general education and in art education in order to provide multiple frameworks for theorizing curricular change. (Typically offered: Fall and Spring)

ARED 6393. Independent Study - Art Education. 3 Hours.

Independent study with varied emphasis on topics relating to Art Education and Visual Culture Studies. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

ARED 686V. Internship in Art Education. 3-6 Hour.

Provides off-campus experiential learning opportunities that will allow students to apply theories into their professional practices. Course content is individualized with a student's internship advisor (an art education faculty member) and a field supervisor. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ARED 695V. Special Topics in Art Education. 1-6 Hour.

Subject matter not covered in regularly offered courses, and relating to art education. May be repeated for different topics. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ARED 6963. Visualizing Critical Race Theory. 3 Hours.

An examination of critical theoretical approaches to the concepts of race and racism. Students will examine the ways in which these constructs perform a critical function in the construction of race(s) and racism(s) and their relevance to visual culture. (Typically offered: Fall and Spring)
This course is cross-listed with PLSC 6963, AAST 6963.

ARED 698V. Master's Thesis in Art Education. 1-6 Hour.

Master's thesis in art education. Prerequisite: ARED 5003, ARED 5013, and ARED 6003. (Typically offered: Fall and Spring) May be repeated for up to 150 hours of degree credit.

Art History (ARHS) Courses

ARHS 5013. Case Studies in Art History. 3 Hours.

This class provides in-depth studies of selected artists, themes, or specific groups of art works. This course is only offered during intersession. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 5563. Pre-Columbian Art. 3 Hours.

An introduction to pre-Columbian art from Mexico (3000 BC- 1521 AD) through a survey of works of art from different media: sculpture, architecture, and mural painting. Topics examined include: sacred images, political uses of sculpture, architecture and cosmogony, as well as the relationship between the material and content. (Typically offered: Irregular)

ARHS 5573. Artists of New Spain. 3 Hours.

An overview of colonial art in colonial New Spain. Focused on native agency, social function of art, and cross-cultural communication. Topics include indigenous materials and techniques, the use of images in legal contexts, and ritual liturgy. Some consideration will be given to artworks from the viceroyalty of Peru. (Typically offered: Irregular)

ARHS 5763. Seminar in Critical Theory. 3 Hours.

(Formerly ARHS 4763.) Study of critical theory as it relates to problems in modern and contemporary art. Graduate degree credit will not be given for both ARHS 4763 and ARHS 5763. (Typically offered: Spring)

ARHS 5773. History of New Media Art. 3 Hours.

(Formerly ARHS 4773.) Examines the history of 'new media' art in relation to larger shifts in technology, philosophy and politics. Beginning in the 19th century, the course explores the development of photography, film, video, performance, sound and digital art through the 20th century. Culminates with an examination of contemporary practice. Graduate degree credit will not be given for both ARHS 4773 and ARHS 5773. (Typically offered: Irregular)

ARHS 5793. Making the Museum: History, Theory and Practice. 3 Hours.

Presents a broad overview of the institutional history and the contemporary professional practice of the museum world. Features numerous visiting lectures from a working professionals from the local area and nationwide institutions. (Typically offered: Spring Even Years)

ARHS 5813. The History of Photography. 3 Hours.

(Formerly ARHS 4813.) Survey of photography from 1685 to present. Graduate degree credit will not be given for both ARHS 4813 and ARHS 5813. (Typically offered: Irregular)

ARHS 5823. History of Graphic Design. 3 Hours.

(Formerly ARHS 4823.) Survey of graphic design history from 1850 to the present. Graduate degree credit will not be given for both ARHS 4823 and ARHS 5823. Prerequisite: ARHS 2923. (Typically offered: Irregular)

ARHS 5833. Ancient Art. 3 Hours.

(Formerly ARHS 4833.) Study of selections from the visual arts of Mesopotamia, Egypt, Greece, or Rome. Graduate degree credit will not be given for both ARHS 4833 and ARHS 5833. (Typically offered: Irregular)

ARHS 5843. Medieval Art. 3 Hours.

(Formerly ARHS 4843.) Study of Early Christian, Byzantine, Early Medieval, Romanesque, and Gothic styles. Graduate degree credit will not be given for both ARHS 4843 and ARHS 5843. (Typically offered: Irregular)

ARHS 5853. Italian Renaissance Art. 3 Hours.

(Formerly ARHS 4853.) Study of Proto-Renaissance, Early, High Renaissance, and Mannerist styles in Italy. Graduate degree credit will not be given for both ARHS 4853 and ARHS 5853. (Typically offered: Irregular)

ARHS 5863. Northern Renaissance Art. 3 Hours.

(Formerly ARHS 4863.) Study of Late Gothic and Renaissance styles in the Netherlands, Germany, and France. Graduate degree credit will not be given for both ARHS 4863 and ARHS 5863. (Typically offered: Irregular)

ARHS 5873. Baroque Art. 3 Hours.

(Formerly ARHS 4873.) Study of art styles of the 17th century, primarily in Italy, Spain, France, Flanders, and the Netherlands. Graduate degree credit will not be given for both ARHS 4873 and ARHS 5873. (Typically offered: Irregular)

ARHS 5883. 18th and 19th Century European Art. 3 Hours.

(Formerly ARHS 4883.) Study of eighteenth- and nineteenth-century art and architecture in Europe. Graduate degree credit will not be given for both ARHS 4883 and ARHS 5883. (Typically offered: Irregular)

ARHS 5893. 20th Century European Art. 3 Hours.

(Formerly ARHS 4893.) Study of the major styles and movements of the century, including Cubism, Fauvism, German Expressionism, and Surrealism. Graduate degree credit will not be given for both ARHS 4893 and ARHS 5893. (Typically offered: Irregular)

ARHS 5913. American Art to 1860. 3 Hours.

(Formerly ARHS 4913.) The visual arts in the United States from Colonial times through 1860. Graduate degree credit will not be given for both ARHS 4913 and ARHS 5913. (Typically offered: Irregular)

ARHS 5923. American Art 1860-1960. 3 Hours.

(Formerly ARHS 4923.) The visual arts in the United States from the onset of the American Civil War through the Cold War Era. Graduate degree credit will not be given for both ARHS 4923 and ARHS 5923. (Typically offered: Irregular)

ARHS 5933. Contemporary Art. 3 Hours.

(Formerly ARHS 4933.) Study of styles and major trends in the visual arts since 1960. Graduate degree credit will not be given for both ARHS 4933 and ARHS 5933. (Typically offered: Fall)

ARHS 5953. Art Museum Studies. 3 Hours.

(Formerly ARHS 4953.) A survey of the history and function of the art museum and an introduction to museum work. Investigation of collections and collections management, conservation, exhibitions, education and public programs, museum management, and contemporary issues which effect the museum profession. Graduate degree credit will not be given for both ARHS 4953 and ARHS 5953. Prerequisite: ARHS 2913 and ARHS 2923, or graduate Art MFA standing. (Typically offered: Irregular)

ARHS 5973. Seminar in Art History. 3 Hours.

(Formerly ARHS 4973.) Special studies of periods and styles of art. Graduate degree credit will not be given for both ARHS 4973 and ARHS 5973. Prerequisite: 9 hours of Art History. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ARHS 5983. Special Topics in Art History. 3 Hours.

(Formerly ARHS 4983.) Subject matter not covered in regularly offered courses, and relating to the history of art before the nineteenth century. May be repeated for different topics. Graduate degree credit will not be given for both ARHS 4983 and ARHS 5983. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 5993. Special Topics in Modern Art. 3 Hours.

(Formerly ARHS 4993.) Subject matter not covered in regularly offered courses, and relating to the history of art from the nineteenth century to the present. May be repeated for different topics. Graduate degree credit will not be given for both ARHS 4993 and ARHS 5993. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 6413. Greek Art and Archaeology. 3 Hours.

Greek Art and Archaeology focuses on how visual and material culture shaped and were shaped by Greek society (religion, politics, military, economy, gender, etc.) from the Bronze Age through the Hellenistic period. Masterpieces of Greek art are analyzed alongside the material remains of everyday Greeks in civic and domestic spaces. (Typically offered: Spring Odd Years)

ARHS 6423. Roman Art and Archaeology. 3 Hours.

Roman Art and Archaeology focuses on how visual and material culture shaped and were shaped by Roman society (religion, politics, economy, gender, ethnicity, etc.) from the Iron Age through the Late Antique period. We encounter famous masterpieces, but also the material remains of everyday Romans in civic and domestic spaces. (Typically offered: Spring Even Years)

ARHS 6613. African Art and Society. 3 Hours.

Situates the artistic production of modern Africa (1800-present) within a socio-cultural framework, taking into consideration the role of the artist, the methods of production, the relationship between form and function, and the impact of geopolitical shifts (including intercontinental trade, colonialization, and globalization) on the artistic practice. (Typically offered: Irregular)

ARHS 6623. African American Art History. 3 Hours.

Surveys African American art from the seventeenth century to the present. It begins with a discussion of the transatlantic slave trade and it examines art produced in what Pratt terms the 'contact zones'. It then follows developments in African American art from the Antebellum Period to the present. (Typically offered: Irregular)

ARHS 6633. Contemporary African Art. 3 Hours.

Serves as a forum for the study of contemporary African art. It situates African art from the 1980s to the present within a historic context, addressing the impact of geopolitical ruptures on artistic practices, and it examines how the work operates across different intellectual, political, and geographical spheres. (Typically offered: Irregular)

ARHS 6783. Special Topics in Contemporary Art. 3 Hours.

Examines specialized topics within the field of contemporary art, with special attention to cutting-edge issues confronting artists today. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ARHS 6933. Graduate Research In Art History. 3 Hours.

Independent study in specific areas of art history and criticism. (Typically offered: Irregular)

Astronomy (ASTR) Courses

ASTR 5033. Astrophysics I: Stars and Planetary Systems. 3 Hours.

An introduction to astrophysics covering stellar structure and evolution, the properties of the solar system, and extrasolar planetary systems. (Typically offered: Fall Odd Years)

This course is cross-listed with SPAC 5033.

ASTR 5043. Astrophysics II: Galaxies and the Large-Scale Universe. 3 Hours.

An introduction to astrophysics covering the interstellar medium, the Milky Way galaxy, extragalactic astronomy, and introduction to cosmology. Prerequisite: ASTR 5033 or SPAC 5033. (Typically offered: Spring Even Years)

ASTR 5073. Cosmology. 3 Hours.

An introduction to modern physical cosmology covering the origin, evolution, and structure of the Universe, based on the Theory of Relativity. (Typically offered: Spring Odd Years)

ASTR 5083. Data Analysis and Computing in Astronomy. 3 Hours.

Study of the statistical analysis of large data sets that are prevalent in the physical sciences with an emphasis on astronomical data and problems. Includes computational lab 1 hour per week. Corequisite: Lab component. (Typically offered: Fall Even Years)

ASTR 5523. Theory of Relativity. 3 Hours.

Conceptual and mathematical structure of the special and general theories of relativity with selected applications. Critical analysis of Newtonian mechanics; relativistic mechanics and electrodynamics; tensor analysis; continuous media; and gravitational theory. (Typically offered: Fall Even Years)

Athletic Training (ATTR)

Courses

ATTR 5213. Athletic Training Clinical I - Application of Injury Prevention Devices and Techniques. 3 Hours.

This course will serve as an introduction to the athletic training clinical program. Procedures and policies of the clinical program and application of athletic preventive devices will be included as well. Corequisite: ATTR 5223. Prerequisite: Admission to the graduate program in athletic training. (Typically offered: Summer)

ATTR 5223. Athletic Training Clinical II - Emergency Procedures. 3 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce and instruct new emergency procedures. Corequisite: ATTR 5213. (Typically offered: Summer)

ATTR 5232. Athletic Training Clinical III - Lower Extremity Evaluation. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training proficiencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce the evaluation skills of gait, lower extremity, and spine/pelvis. Prerequisite: ATTR 5223. (Typically offered: Fall)

ATTR 5242. Athletic Training Clinical IV - Evaluation of Upper Extremity. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce the evaluation skills of the upper extremities, head, neck, and posture. Prerequisite: ATTR 5232. (Typically offered: Spring)

ATTR 5253. Professionalism in Athletic Training. 3 Hours.

This course has dual purposes: to educate students on athletic training educational competencies related to professionalism and professional responsibility in the field of athletic training; and to provide an immersive clinical experience under the direct supervision of a preceptor as required by the accrediting body. Students will engage with information about professionalism in both the course material and the clinical experience. (Typically offered: Summer)

ATTR 5262. Athletic Training Clinical V - Rehabilitation Lab. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and reinforce techniques and applications of therapeutic exercise and rehabilitation. (Typically offered: Fall)

ATTR 5272. Athletic Training Clinical VI - Athletic Training Seminar. 2 Hours.

This course will serve as a process for monitoring student's progression of athletic training competencies, acquire clinical hours under the direct supervision of a certified athletic trainer, and serve as a capstone course validating the athletic training clinical proficiencies and prepare students for the NATABOC certification exam and future employment. Prerequisite: ATTR 5262. (Typically offered: Spring)

ATTR 5313. Clinical Anatomy for Athletic Trainers. 3 Hours.

Instruction of human anatomy for the athletic training professional using lecture, diagrams, textbook readings, and demonstrations. Focus will be placed on anatomy of structures related to athletic injuries; and can be used in the evaluation, treatment, and rehabilitation of injuries in a variety of athletic training settings. Prerequisite: Acceptance into the graduate athletic training program or instructor consent. (Typically offered: Summer)

ATTR 5363. Evaluation Techniques of Athletic Injuries - Upper Extremity. 3 Hours.

Use of scientific assessment methods to recognize and evaluate the nature and severity of athletic injuries to the upper extremities, trunk, and head. Prerequisite: Admission to graduate athletic training program. (Typically offered: Spring)

ATTR 5373. Evaluation Techniques of Athletic Injuries - Lower Extremity. 3 Hours.

Use of scientific assessment methods to recognize and evaluate the nature and severity of athletic injuries to the hip and lower extremities. Prerequisite: Admission to graduate athletic training program. (Typically offered: Fall)

ATTR 5403. Pathophysiology and Treatment I. 3 Hours.

This course will provide knowledge, skills, and values that the entry-level athletic trainer must possess to prevent, recognize, treat, advise on medications for and, when appropriate, refer general medical conditions and disabilities of physically active individuals. Prerequisite: Admission to the athletic training program. (Typically offered: Spring)

ATTR 5413. Pathophysiology and Treatment II. 3 Hours.

This course will provide knowledge, skills, and values that the entry-level athletic trainer must possess to prevent, recognize, treat, advise on medications for and, when appropriate, refer general medical conditions and disabilities of physically active individuals. Prerequisite: ATTR 5403. (Typically offered: Fall)

ATTR 5453. Therapeutic Modalities in Athletic Training. 3 Hours.

Contemporary therapeutic modalities used in managing athletic injuries. Modalities covered are classified as thermal agents, electrical agents, or mechanical agents. Emphasis is placed on their physiological effects, therapeutic indications (and contraindications), and clinical application. Prerequisite: Admission to graduate athletic training program. (Typically offered: Fall)

ATTR 5463. Therapeutic Exercise and Rehabilitation of Athletic Injuries. 3 Hours.

A systematic approach to exercise program development, techniques, indications and contraindications of exercise, and progression as related to athletic injury, prevention, and return to play guidelines. Prerequisite: Admission to graduate athletic training program. (Typically offered: Fall)

ATTR 5473. Administration in Athletic Training. 3 Hours.

Administrative components of athletic training. Basic concepts of legal liability, leadership and management principles, financial management, day to day scheduling and supervision, maintenance, and general administration. Prerequisite: Admission to graduate athletic training program. (Typically offered: Summer)

ATTR 5483. Medical Conditions in Athletic Training. 3 Hours.

This course will provide a collection of knowledge, skills, and values that the entry-level certified athletic trainer must possess to recognize, treat, and refer, when appropriate, the general medical conditions and disabilities of athletes and others involved in physical activity. Prerequisite: Admission to the graduate athletic training program or permission of instructor. (Typically offered: Fall)

ATTR 5493. Evidence-Based Practice in Athletic Training. 3 Hours.

In-depth analysis of current literature, research, case studies, and musculoskeletal evaluation and rehabilitation directed toward musculoskeletal injuries of the physically active. Prerequisite: Admission into the Athletic Training Education Program. (Typically offered: Summer)

Biological Engineering (BENG)

Courses

BENG 500V. Advanced Topics in Biological Engineering. 1-6 Hour.

Special problems in fundamental and applied research. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

BENG 5103. Advanced Instrumentation in Biological Engineering. 3 Hours.

Applications of advanced instrumentation in biological systems. Emphasis on updated sensing and transducing technologies, data acquisition and analytical instruments. Lecture 2 hours, lab 3 hours per week. Corequisite: Lab component. Prerequisite: BENG 3113. (Typically offered: Spring Even Years)

BENG 5253. Bio-Mems. 3 Hours.

Topics include the fundamental principles of microfluidics, Navier-Stokes Equation, bio/abio interfacing technology, bio/abio hybrid integration of microfabrication technology, and various biomedical and biological problems that can be addressed with microfabrication technology and the engineering challenges associated with it. Lecture 3 hour per week. Prerequisite: MEEG 3503 or CVEG 3213 or CHEG 2133. (Typically offered: Irregular)
This course is cross-listed with MEEG 5253.

BENG 5613. Simulation Modeling of Biological Systems. 3 Hours.

Application of computer modeling and simulation of discrete-event and continuous-time systems to solve biological and agricultural engineering problems. Philosophy and ethics of representing complex processes in simplified form. Deterministic and stochastic modeling of complex systems, algorithm development, application limits, and simulation interpretation. Emphasis on calibration, validation and testing of biological systems models for the purposes of system optimization, resource allocation, real-time control and/or conceptual understanding. Prerequisite: AGST 5023 or (STAT 3003 or STAT 5003) or INEG 2313. (Typically offered: Irregular)

BENG 5623. Life Cycle Assessment. 3 Hours.

This course will examine the process and methodologies associated with life cycle analysis (LCA). The course will explore the quantitatively rigorous methodology for life cycle inventory (LCI), LCA and life cycle impact assessment (LCIA). This course is offered on-line. The principal instructor will be a UA faculty member. (Typically offered: Spring)

BENG 5633. Linkages Among Technology, Economics and Societal Values. 3 Hours.

Addresses how macro-level change is influenced by the linkages among technology, economics and societal values. Three major course initiatives: 1) Developing a conceptual model for understanding how macro-level change has occurred over history; 2) Examining recorded history in order to develop a contextual appreciation for Society's current situation; and 3) Using statistical data to identify six overriding world trends that are likely to greatly impact society's goal of achieving sustainable prosperity and well-being in the foreseeable future. Prerequisite: Graduate standing or instructor permission. (Typically offered: Fall and Spring)
This course is cross-listed with OMG 5633.

BENG 5703. Design and Analysis of Experiments for Engineering Research. 3 Hours.

Principles of planning and design of experiments for engineering research. Propagation of experimental error. Improving precision of experiments. Analysis of experimental data for optimal design and control of engineering systems using computer techniques. Students must have an introductory background in statistics. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. (Typically offered: Irregular)

BENG 5801. Graduate Seminar. 1 Hour.

Reports presented by graduate students on topics dealing with current research in biological engineering. Prerequisite: Graduate standing. (Typically offered: Spring)

BENG 5923. Nonpoint Source Pollution Control and Modeling. 3 Hours.

Control of hydrologic, meteorologic, and land use factors on nonpoint source (NPS) pollution in urban and agricultural watersheds. Discussion of water quality models to develop NPS pollution control plans and total maximum daily loads (TMDLs), with consideration of model calibration, validation, and uncertainty analysis. Prerequisite: CVEG 3223. (Typically offered: Irregular)

BENG 5933. Environmental and Ecological Risk Assessment. 3 Hours.

Process and methodologies associated with human-environmental and ecological risk assessments. Environmental risk assessments based on human receptors as endpoints, addressing predominantly abiotic processes. Ecological risk assessments based on non-human receptors as endpoints. Approach using hazard definition, effects assessment, risk estimation, and risk management. Application of methods to student projects to gain experience in defining and quantifying uncertainty associated with human perturbation, management and restoration of environmental and ecological processes. (Typically offered: Spring)

BENG 5963. Modeling Environmental Biophysics. 3 Hours.

Interactions between the biosphere and the atmosphere. Connecting the physical environment of solar energy, wind, soil, and hydrology to the biosphere through plant ecophysiology. Boundary layer meteorology, photosynthesis and boundary layer modeling strategies, and the soil-plant-atmosphere continuum. Instrumentation, measurement and modeling strategies for understanding leaf-, landscape- and regional behaviors; and, the transfer, kinetics, and balance of momentum, energy, water vapor, CO₂, and other atmospheric trace gases between the landscape (vegetation and soil) and the atmosphere. Applications in sustainable agriculture, irrigation, land and water resources, and modeling plant water use and carbon uptake strategies. A working knowledge of calculus and a discipline related to the course is expected. Three hours of lecture per week. Students may not earn degree credit for both BENG 4963 and BENG 5963. Prerequisite: Instructor consent. (Typically offered: Spring Even Years)

BENG 5973. Advanced Practice in Water Quality Monitoring and Analysis. 3 Hours.

Application of water quality principles to a real world problem. Team project experience leading and developing quality assurance project plans, designing monitoring systems, selecting chemical analysis methods, estimating loads, performing trend analysis, basic model calibration and validation, team management, and technical report writing and oral presentations. Working with various clientele to analyze water quality data in the context of evaluating real-world problems and issues. Three hours of lecture per week. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

BENG 600V. Master's Thesis. 1-6 Hour.

Graduate standing required for enrollment. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

BENG 700V. Doctoral Dissertation. 1-18 Hour.

Candidacy is required for enrollment. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Biology (BIOL) Courses

BIOL 5001. Seminar in Biology. 1 Hour.

Discussion of selected topics and review of current literature in any area of the biological sciences. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.
This course is cross-listed with CEMB 5911.

BIOL 5003L. Laboratory in Prokaryote Biology. 3 Hours.

Laboratory techniques in prokaryote culture, identification, physiology, metabolism, and genetics. Laboratory 6 hours per week. Prerequisite: BIOL 3123. (Typically offered: Fall and Spring)

BIOL 5024. Insect Diversity and Taxonomy. 4 Hours.

(Formerly BIOL 4024.) Principles and practices of insect classification and identification with emphasis on adult insects. 2.5 hours lecture, 4 hours lab. Previous knowledge of basic entomology is necessary. Graduate degree credit will not be given for both BIOL 4024 and BIOL 5024. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Fall)
This course is cross-listed with ENTO 5024.

BIOL 5034. Wildlife Management Techniques. 4 Hours.

(Formerly BIOL 4734.) To familiarize students with techniques used in the management of wildlife populations. Students will be exposed to field methods, approaches to data analysis, experimental design, and how to write a scientific paper. Management applications will be emphasized. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4734 and BIOL 5034. Corequisite: Lab component. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5053. Insect Ecology. 3 Hours.

(Formerly BIOL 4053.) Teaches important ecological concepts through study of dynamic relationships among insects and their environment. Introduces literature of insect ecology, and interpretation and critique of ecological research. Previous knowledge of basic entomology and/or ecology will be assumed. 2 hours lecture/2 hours lab. Graduate degree credit will not be given for both BIOL 4053 and BIOL 5053. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Fall Even Years)

This course is cross-listed with ENTO 5053.

BIOL 5104. Taxonomy of Flowering Plants. 4 Hours.

(Formerly BIOL 4104.) Identifying, naming, and classifying of wildflowers, weeds, trees, and other flowering plants. Emphasis is on the practical aspects of plant identification. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4104 and BIOL 5104. Corequisite: Lab component. Prerequisite: BIOL 1613 and BIOL 1611L and BIOL 2323 and BIOL 3023. (Typically offered: Spring)

BIOL 5113. Insect Behavior and Chemical Ecology. 3 Hours.

Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Spring Even Years)

This course is cross-listed with ENTO 5113.

BIOL 5122. Food Microbiology. 2 Hours.

(Formerly BIOL 4122.) The study of food microbiology including classification/taxonomy, contamination, preservation and spoilage of different kinds of foods, pathogenic microorganisms, food poisoning, sanitation, control and inspection and beneficial uses of microorganisms. Graduate degree credit will not be given for both BIOL 4122 and BIOL 5122. Prerequisite: BIOL 2013 and BIOL 2011L or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with FDSC 5122.

BIOL 5124. Dendrology. 4 Hours.

(Formerly BIOL 4114.) Morphology, classification, geographic distribution, and ecology of woody plants. Lecture 3 hours, laboratory 3 hours per week, and fieldtrips. Graduate degree credit will not be given for both BIOL 4114 and BIOL 5124. Prerequisite: BIOL 3863. (Typically offered: Fall)

BIOL 5133. Insect Molecular Genetics. 3 Hours.

A hands on course in insect molecular genetic techniques including molecular diagnostics and population genetics. Students will learn how to apply advanced molecular genetic methodologies and Internet database resources to insects that they are using for their graduate research. (Typically offered: Spring Even Years)

This course is cross-listed with ENTO 5133.

BIOL 5153. Practical Programming for Biologists. 3 Hours.

Hands-on instruction in the fundamentals of biological computing. Students learn how to set up a Unix work station, work from the command line, install software, build databases, and program in Python, a popular scripting language for biological applications. Most examples focus on the analysis of genomic data. (Typically offered: Spring)

BIOL 5163. Dynamic Models in Biology. 3 Hours.

(Formerly BIOL 4163.) Mathematical and computational techniques for developing, executing, and analyzing dynamic models arising in the biological sciences. Both discrete and continuous time models are studied. Applications include population dynamics, cellular dynamics, and the spread of infectious diseases. Graduate degree credit will not be given for both BIOL 4163 and BIOL 5163. Prerequisite: MATH 2554. (Typically offered: Irregular)

BIOL 5174. Conservation Genetics. 4 Hours.

Covers concepts of biodiversity identification and illustrates how genetic data are generated and analyzed to conserve and restore biological diversity. Corequisite: Lab component. Prerequisite: BIOL 3023, BIOL 3863 and STAT 2823 (or equivalent) and graduate standing. (Typically offered: Spring)

BIOL 5213. Biological Regulation and Subcellular Communication. 3 Hours.

Combines lectures, review of primary literature, student presentations, and small group discussions to explore a diversity of topics related to mechanisms of biological regulation and subcellular communication. Prerequisite: Graduate standing. (Typically offered: Irregular)

BIOL 5223. Bacterial Lifestyles. 3 Hours.

The course will introduce students to bacteria as prokaryotic organisms, different from eukaryotes such as plants and animals. Model microbial systems will be studied in more detail to identify unique strategies that bacteria employ to thrive in their respective environment, whether they are causing diseases or establishing beneficial interactions with animal or plants or coexisting with other microorganisms in diverse ecological environments. The course will also cover special adaptations that bacteria have evolved to adapt to harsh environments and how these adaptations can be harnessed to control pollution. Prerequisite: (BIOL 2013 and BIOL 2011L) or BIOL 3123. (Typically offered: Spring Odd Years)

This course is cross-listed with PLPA 5123.

BIOL 5233. Genomics and Bioinformatics. 3 Hours.

Principles of molecular and computational analyses of genomes. Prerequisite: BIOL 2533 or BIOL 2323. (Typically offered: Spring)

BIOL 5241L. Ichthyology Laboratory. 1 Hour.

Practical application of fish identification based on anatomy, fish sampling methods, and curation of fish specimen. Laboratory component of BIOL 5243. Corequisite: BIOL 5243. (Typically offered: Spring Odd Years)

BIOL 5243. Ichthyology. 3 Hours.

Comprehensive overview of the diversity of fishes. Covers anatomy, physiology, evolution, taxonomy, ecology, behavior, zoogeography and conservation of marine and freshwater fishes. Lecture 3 hours per week. Corequisite: BIOL 5241L. (Typically offered: Spring Odd Years)

BIOL 5254. Comparative Physiology. 4 Hours.

(Formerly BIOL 4234.) Comparison of fundamental physiological mechanisms in various animal groups. Adaptations to environmental factors at both the organismal and cellular levels are emphasized. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4234 and BIOL 5254. Prerequisite: BIOL 2533 and CHEM 3613 and (CHEM 3611L or CHEM 3612M). (Typically offered: Fall)

BIOL 5263. Cell Physiology. 3 Hours.

In-depth molecular coverage of cellular processes involved in growth, metabolism, transport, excitation, signaling and motility, with emphasis on function and regulation in eukaryotes, primarily animals. Prerequisite: BIOL 2323, BIOL 2533, BIOL 2531L, CHEM 3813, and PHYS 2033. (Typically offered: Fall)

BIOL 5273. Endocrinology. 3 Hours.

In endocrinology we study hormonal integration of living processes at all levels from molecule to organism. We will work with the mechanisms of hormone action, the endocrine control axes and hormones physiological role. The course will include paper discussions and student presentations on topics of special interest. (Typically offered: Spring)

BIOL 5303. Plant Physiology. 3 Hours.

Introductory course in plant physiology focusing on cellular processes that support the metabolic, developmental, and reproductive needs of plants. Prerequisite: 3 hours of cell biology or biochemistry. (Typically offered: Fall)

BIOL 5313. Molecular Cell Biology. 3 Hours.

In-depth molecular coverage of transcription, cell cycle, translation, and protein processing in eukaryotes and prokaryotes. Prerequisite: BIOL 2533 and BIOL 2323 and CHEM 3603 and CHEM 3601L and CHEM 3613 and CHEM 3611L. (Typically offered: Spring)

BIOL 5323. Comparative Neurobiology. 3 Hours.

Exploration of modern research approaches to understanding the development and function of animal nervous systems, with emphasis on molecular and cellular approaches in non-human animal models commonly used in biomedical research. Format combines lectures, group discussions, and student presentations using examples from the primary neurobiology literature. Prerequisite: Graduate standing. (Typically offered: Irregular)

BIOL 5343. Advanced Immunology. 3 Hours.

Aspects of innate, cell-mediated, and humoral immunity in mammalian and avian species. Molecular mechanisms underlying the function of the immune system are emphasized. A course in Basic Immunology prior to enrollment in Advanced Immunology is recommended but not required. Lecture 3 hours per week. (Typically offered: Spring)

This course is cross-listed with POSC 5343.

BIOL 5352L. Immunology in the Laboratory. 2 Hours.

Laboratory course on immune-diagnostic laboratory techniques and uses of antibodies as a research tool. Included are cell isolation and characterization procedures, immunochemistry, flow cytometry, ELISA and cell culture assay systems. Laboratory 6 hours per week. Prerequisite: POSC 5343 or BIOL 5343. (Typically offered: Spring)

This course is cross-listed with POSC 5352L.

BIOL 5353. Ecological Genetics/genomics. 3 Hours.

Analysis of the genetics of natural and laboratory populations with emphasis on the ecological bases of evolutionary change. Prerequisite: BIOL 2323 and BIOL 2321L, BIOL 3023 and MATH 2554 and STAT 2823 or equivalents. (Typically offered: Fall Odd Years)

BIOL 5404. Comparative Botany. 4 Hours.

A comparative approach to organisms classically considered to be plants with emphasis on morphology, life history, development, and phylogeny. Three hours lecture, 4 hours lab per week. Corequisite: Lab component. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

BIOL 5414. Mycology. 4 Hours.

Form and function of the fungi. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Laboratory component. (Typically offered: Irregular)

BIOL 5433. Principles of Evolution. 3 Hours.

Advanced survey of the mechanisms of evolutionary change with special emphasis on advances since the Modern Synthesis. Historical, theoretical, and population genetics approaches are discussed. Recommended: BIOL 3023 and BIOL 2321L and BIOL 3861L. Prerequisite: BIOL 2323 and BIOL 3863. (Typically offered: Fall Even Years)

BIOL 5463. Physiological Ecology. 3 Hours.

Interactions between environment, physiology, and properties of individuals and populations on both evolutionary and ecological scales. Prerequisite: BIOL 3863 and BIOL 4234. (Typically offered: Spring Odd Years)

BIOL 5511L. Population Ecology Laboratory. 1 Hour.

Demonstration of the models and concepts from BIOL 5513. Pre- or Corequisite: BIOL 5513. (Typically offered: Fall Even Years)

BIOL 5513. Population Ecology. 3 Hours.

Survey of theoretical and applied aspects of populations processes stressing models of growth, interspecific interactions, and adaptation to physical and biotic environments. Corequisite: BIOL 5511L. Prerequisite: BIOL 3863. (Typically offered: Fall Even Years)

BIOL 5523. Plant Ecology. 3 Hours.

To develop understanding of important ecological concepts through study of dynamics relationships among plants and their environment. To become familiar with the literature of plant ecology, and interpretation and critique of ecological research. Prerequisite: BIOL 3863. (Typically offered: Spring Even Years)

BIOL 5524. Developmental Biology with Laboratory. 4 Hours.

An analysis of the concepts and mechanisms of development emphasizing the experimental approach. Students may not receive degree credit for both BIOL 5543 Developmental Biology and BIOL 5524 Developmental Biology with Laboratory. Corequisite: Lab component. (Typically offered: Fall)

BIOL 5534. Biochemical Genetics. 4 Hours.

Lectures and laboratories based on modern molecular genetic techniques for analyses of eukaryotes and manipulation of prokaryotes. A hands-on course in recombinant DNA techniques: laboratory practices in gene identification, cloning, and characterization. Lecture 2 hours, laboratory 6 hours per week. Corequisite: Lab component. Prerequisite: BIOL 2323 (or equivalent) and CHEM 3813 (or equivalent). (Typically offered: Spring)

BIOL 5543. Developmental Biology. 3 Hours.

An analysis of the principles and mechanisms of development emphasizing the embryonic and postembryonic development of animals. Degree credit will not be allowed for both BIOL 5543 and BIOL 5524. (Typically offered: Irregular)

BIOL 5553. Astrobiology. 3 Hours.

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes the origin and evolution of life on Earth, possibility of life elsewhere in the solar system (including Mars), and the possibility of life on planets around other stars. Prerequisite: Instructor consent. (Typically offered: Irregular)
This course is cross-listed with SPAC 5553.

BIOL 5563. Cancer Biology. 3 Hours.

An introduction to the fundamentals of cancer biology. Prerequisite: BIOL 2533. (Typically offered: Fall)

BIOL 5613. Primate Adaptation and Evolution. 3 Hours.

(Formerly BIOL 4613.) Introduction to the biology of the order Primates. This course considers the comparative anatomy, behavioral ecology and paleontology of our nearest living relatives. Graduate degree credit will not be given for both BIOL 4613 and BIOL 5613. Prerequisite: BIOL 3023 or ANTH 1013. (Typically offered: Spring)
This course is cross-listed with ANTH 5623.

BIOL 5634. Wetlands Ecology and Management. 4 Hours.

To familiarize students with the ecology and management of wetlands. Students will be exposed to the characteristics of wetlands, the environmental factors that produce wetland types, and the management techniques used to meet desired wetland goals. Primary lecture topics will include: wetland definition, wetlands of the world, wetland status, trends, laws, wetland hydrology, wetland soils, wetland plants, wetland plant adaptations, wetland ecosystem development, and wetland management. Lecture 2 hours, Laboratory 3 hours per week. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5643. Eukaryote Phylogeny. 3 Hours.

Molecular analysis of the eukaryotic tree of life, phylogenetic tree reconstruction, and eukaryote diversity and evolutionary relationships. (Typically offered: Spring Odd Years)

BIOL 5693. Forest Ecology. 3 Hours.

(Formerly BIOL 4693.) Introduction to the various biological, ecological and historical aspects of forest communities, with particular emphasis on the forests of the central and southeastern United States. Graduate degree credit will not be given for both BIOL 4693 and BIOL 5693. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5703. Mechanisms of Pathogenesis. 3 Hours.

A survey of events causing human disease at the molecular, cellular and genetic levels. Seeks to develop an appreciation that both the tricks pathogens use and the body's own defenses contribute to pathology. (Typically offered: Fall)

BIOL 5711L. Basic Immunology Laboratory. 1 Hour.

(Formerly BIOL 4711L.) Basic immunology laboratory. Graduate degree credit will not be given for both BIOL 4711L and BIOL 5711L. Corequisite: BIOL 5713. (Typically offered: Spring)

BIOL 5713. Basic Immunology. 3 Hours.

A general overview of Immunity with emphasis on the underlying cellular, molecular and genetic events controlling immune reactions. Reading of the primary literature on disease states involving the immune system. (Typically offered: Spring)

BIOL 5723. Fish Biology. 3 Hours.

Morphology, classification, life histories, population dynamics, and natural history of fishes and fish-like vertebrates. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: 12 hours of biological sciences. (Typically offered: Spring Odd Years)

BIOL 5734. Protistology. 4 Hours.

The biology of eukaryotes other than animals, land plants, and fungi with emphasis on morphology and modern approaches to phylogenetic systematics. Three hours lecture, four hours lab/week. Involves writing term papers. Corequisite: Lab component. (Typically offered: Irregular)

BIOL 5743. Herpetology. 3 Hours.

Morphology, classification and ecology of amphibians and reptiles. Lecture 2 hours, laboratory 1 hour per week. Corequisite: Lab component. (Typically offered: Spring Even Years)

BIOL 5753. General Virology. 3 Hours.

An introduction to viral life-cycles, structure, and host cell interactions. Emphasis placed on molecular and biochemical aspects of virology. Two hour lecture and one hour discussion. Prerequisite: BIOL 2533 and BIOL 2323. (Typically offered: Spring)

BIOL 5763. Ornithology. 3 Hours.

Taxonomy, morphology, physiology, behavior, and ecology of birds. Lecture, laboratory, and field work. Corequisite: Lab component. Prerequisite: 10 hours of biological sciences. (Typically offered: Spring Even Years)

BIOL 5774. Biometry. 4 Hours.

(Formerly BIOL 4774.) Students learn biological statistics and experimental design by actually designing experiments and analyzing data, as well as through lecture, discussion, reading, writing, and problem solving. Lecture 3 hours, laboratory 3 hours each week. Graduate degree credit will not be given for both BIOL 4774 and BIOL 5774. Corequisite: Lab component. Prerequisite: STAT 2823 or equivalent, BIOL 3863. (Typically offered: Spring Even Years)

BIOL 5783. Mammalogy. 3 Hours.

Lectures and laboratory dealing with classification, morphology, distribution, ecology, behavior, and physiology of mammals. Two hours lecture, 4 hours laboratory. Corequisite: Lab component. (Typically offered: Fall)

BIOL 5793. Introduction to Neurobiology. 3 Hours.

(Formerly BIOL 4793.) Exploration of the neurological underpinnings of perception, action, and experience including: how sense receptors convert information in the world into electricity, how information flows through the nervous systems, how neural wiring makes vision possible, how the nervous system changes with experience, and how the system develops. Graduate degree credit will not be given for both BIOL 4793 and BIOL 5793. Prerequisite: BIOL 2533. (Typically offered: Spring)

BIOL 580V. Special Topics in Biological Sciences. 1-6 Hour.

Consideration of new areas of biological sciences not yet treated adequately in other courses. Prerequisite: 8 hours of biological sciences. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

BIOL 5833. Animal Behavior. 3 Hours.

Organization, regulation, and phylogeny of animal behavior, emphasizing vertebrates. Lecture, laboratory, and field work. Corequisite: Lab component. (Typically offered: Fall Odd Years)

BIOL 5843. Conservation Biology. 3 Hours.

The study of direct and indirect factors by which biodiversity is impacted by human activity. It is a synthetic field of study that incorporates principles of ecology, biogeography, population genetics, economics, sociology, anthropology, philosophy, geology, and geography. Prerequisite: BIOL 3863. (Typically offered: Irregular)

BIOL 5844. Community Ecology. 4 Hours.

Survey of theoretical and applied aspects of community processes stressing structure, trophic dynamics, community interactions, and major community types. Corequisite: Lab component. Prerequisite: BIOL 3863. (Typically offered: Fall Odd Years)

BIOL 5863. Analysis of Animal Populations. 3 Hours.

(Formerly BIOL 4863.) Basic principles of design and analysis for population studies of fish and wildlife species. Students will be instructed in the use of the latest software for estimating population parameters. Focus will be on both concepts and applications. Management applications of estimated parameters will be emphasized. Lecture 2 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both BIOL 4863 and BIOL 5863. Corequisite: Lab component. Prerequisite: BIOL 3863. (Typically offered: Spring Even Years)

BIOL 5873. Microbial Molecular Genetics and Informatics. 3 Hours.

Fundamentals of microbial genomics and bioinformatics. Course covers microbial genetics, genetic structure, genome organization, proteome organization, approaches for the analysis of DNA, RNA, and proteins, cellular metabolic pathways, genetic regulation, small RNA molecules, functional genomics, metagenomics, and bioinformatics approaches for analysis of microbial genomes. Prerequisite: Graduate status. (Typically offered: Fall)

BIOL 5883. Mammalian Evolution and Osteology. 3 Hours.

Focuses on describing the evolutionary history of mammals, a group of vertebrates that include over 5,000 species in 29 orders, and will provide an overview of living species and their identifying features. Credit will not be given for both ANTH 4703 and ANTH 5703. Prerequisite: Instructor consent. (Typically offered: Fall Even Years)

This course is cross-listed with ANTH 5703.

BIOL 5914. Stream Ecology. 4 Hours.

Current concepts and research in lotic ecosystem dynamics. Lecture, laboratory, field work and individual research projects required. Corequisite: Lab component. Prerequisite: 3 hours of ecology-related coursework. (Typically offered: Fall Even Years)

BIOL 5933. Global Biogeochemistry: Elemental Cycles and Environmental Change. 3 Hours.

This course explores the chemical, biological, and geological processes occurring within ecosystems. An understanding of these processes is used to investigate how they form the global biogeochemical cycles that provide energy and nutrients necessary for life. Class discussions focus on global change and the effects of more recent anthropogenic influences. Prerequisite: 3 hours of chemistry or biochemistry and ecology. (Typically offered: Spring Odd Years)

BIOL 596V. Culture and Environment: Field Studies. 1-6 Hour.

(Formerly BIOL 496V.) May be taken by students participating in overseas study programs or other domestic field study programs approved by the department. Graduate degree credit will not be given for both BIOL 496V and BIOL 596V. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

BIOL 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

BIOL 6113. Insect Physiology. 3 Hours.

General and comparative physiology of insects. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. (Typically offered: Spring Even Years)

This course is cross-listed with ENTO 6113.

BIOL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Biomedical Engineering (BMEG) Courses

BMEG 5103. Design and Analysis of Experiments in Biomedical Research. 3 Hours.

An advanced course covering sample size estimation with power calculations, protection of vertebrate animals and human subjects, factorial design, multivariate analysis of variance, parametric and non-parametrics data analysis, Kaplan-meier analysis, and post-test correction of multiple comparisons as related to biomedical data. Prerequisite: MATH 2584 and BMEG 3653 or equivalents. (Typically offered: Irregular)

BMEG 5203. Mathematical Modeling of Physiological Systems. 3 Hours.

Application of numerical methods and mathematical techniques to physiological systems. Cellular physiology topics include models of cellular metabolism, diffusion, membrane potential, excitability, calcium dynamics and intercellular signalling. Cardiovascular system topics include models of blood cells, oxygen transport, cardiac output, cardiac regulation, and circulation. Other physiology topics include respiration, muscle, vision, hearing, voice, and speech. Prerequisite: MATH 2584 or BMEG 3653 or BMEG 4623 or equivalents. (Typically offered: Irregular)

BMEG 5213. Tissue Mechanics. 3 Hours.

The purpose of this course is to introduce students to non-linear biomechanics of soft tissues such as skin, bladder, blood vessels, and the brain. Topics covered: Tissue mechanics: continuum biomechanics, tensor analysis, kinematics of continua, balance laws. Governing physics of mechanics as applied to soft tissues. Various constitutive relations will be discussed: linear elastic, hyperelastic, viscoelastic, poroelastic, and inelastic materials with internal variables. Cannot receive credit for both BMEG 4213 and BMEG 5213. Prerequisite: BMEG 2813 and BMEG 4623 or equivalents. (Typically offered: Irregular)

BMEG 5313. Advanced Biomaterials and Biocompatibility. 3 Hours.

From Absorbable sutures to Zirconium alloy hip implants, biomaterials science influences nearly every aspect of medicine. This course focuses on the study of different classes of biomaterials and their interactions with human tissues. Prerequisite: BMEG 3634 and BMEG 4623 or equivalents. (Typically offered: Irregular)

BMEG 5423. Regenerative Medicine. 3 Hours.

The course covers five broad areas: Biological and molecular basis for regenerative medicine, tissue development, regenerative medicine and innovative technologies, clinical applications of regenerative medicine, and regulation and ethics. Prerequisite: BIOL 2533 and BMEG 3824 or equivalents. (Typically offered: Irregular)

BMEG 5513. Biomedical Optics and Imaging. 3 Hours.

This course will provide students with a fundamental understanding of various biomedical imaging modalities. Topics will include: Basics of light-tissue interaction - absorption, fluorescence, elastic and inelastic scattering; Computational and analytical models of light propagation to quantify tissue optical properties; Optical imaging techniques - spectroscopy, tomography, and laser speckle with potential clinical applications; and Clinical imaging modalities and recent advances - X-ray, Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), Computed Tomography (CT), Ultrasound imaging, and Photoacoustic imaging. At the end of this course, students should have a good understanding of optical imaging, spectroscopy, and non-optical imaging modalities, specific anatomical sites that they are best suited for, and the trade-offs between imaging depth and resolution. Students may not receive credit for both BMEG 4513 and BMEG 5513. (Typically offered: Irregular)

BMEG 5523. Biomedical Data and Image Analysis. 3 Hours.

This course focuses on an introduction to image processing and analysis for applications in biomedical research. After a review of basic MATLAB usage, students will learn fundamental tools for processing and analyzing data from a variety of subdisciplines within biomedical engineering. Topics include: filtering, thresholding, segmentation, morphological processing, and image registration. Through exercises involving 1D, 2D, and 3D data, students will develop problem-solving skills and a knowledge base in MATLAB required for customized quantitative data analysis. Students may not receive credit for both BMEG 4523 and BMEG 5523. Prerequisite: Graduate standing. (Typically offered: Irregular)

BMEG 560V. Advanced Individual Study. 1-6 Hour.

Individual study and research of a topic mutually agreeable to the student and faculty member. Prerequisite: Graduate standing. (Typically offered: Irregular)

BMEG 570V. Advanced Special Topics. 1-6 Hour.

Consideration of current biomedical engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 15 hours of degree credit.

BMEG 5713. Cardiovascular Physiology and Devices. 3 Hours.

Understanding etymology of disease while creating solutions and dedicated devices is the primary focus of biomedical engineering. This course describes an interdisciplinary approach of the clinical and engineering worlds to develop devices for treating cardiovascular disease. The first part of the course will be a thorough review of the relevant anatomic and physiological considerations important for developing devices. Understanding these considerations from an engineering perspective to inform device development will be the second part of the course. Students may not receive credit for both BMEG 4713 and BMEG 5713. Prerequisite: Graduate standing. (Typically offered: Irregular)

BMEG 5800. Graduate Seminar I. 0 Hours.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including research ethics, authorship, biosafety and the use of animals in biomedical research. Prerequisite: BMEG 5801. (Typically offered: Fall) May be repeated for up to 0 hours of degree credit.

BMEG 5801. Graduate Seminar I. 1 Hour.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including research ethics, authorship, biosafety and the use of animals in biomedical research. (Typically offered: Fall) May be repeated for up to 2 hours of degree credit.

BMEG 5810. Graduate Seminar II. 0 Hours.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including professional development, career options, effective communication, technology transfer, clinical translation and intellectual property. Prerequisite: BMEG 5811. (Typically offered: Spring) May be repeated for up to 0 hours of degree credit.

BMEG 5811. Graduate Seminar II. 1 Hour.

A weekly seminar series comprised of presentations by invited speakers and graduate students as well as didactic instruction in relevant topics including professional development, career options, effective communication, technology transfer, clinical translation and intellectual property. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

BMEG 5953. Fundamentals of Fracture and Fatigue in Structures. 3 Hours.

The course will cover the concepts of linear-elastic, elastic-plastic and time-dependent Fracture Mechanics as applied to fracture in a variety of materials, structures, and operating conditions. The examples will include fracture in large components such as aircraft, bridges and pressure vessels and also in bones and in soft materials and human tissue. Prerequisite: Graduate standing in Civil, Mechanical or Biomedical Engineering or consent of the instructor. (Typically offered: Fall and Spring)

This course is cross-listed with MEEG 5953, CVEG 5953.

BMEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

BMEG 700V. Doctoral Dissertation. 1-6 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

Career and Technical Education (CATE) Courses

CATE 5003. Introduction to Professionalism. 3 Hours.

This course examines the principles and concepts of professionalism in the teaching profession, with an emphasis on developing professional concepts in the profession. Added emphasis is on career and technical education organizations. Prerequisite: Admission to the CATE teacher education program. (Typically offered: Fall)

CATE 5013. Teaching Strategies. 3 Hours.

This course is designed to offer a variety of ideas and experiences concerning methods of teaching, planning and presenting instruction. (Typically offered: Fall)

CATE 5016. Cohort Teaching Internship. 6 Hours.

A minimum of 12 weeks will be spent in an off-campus school, at which time the intern will have an opportunity under supervision to observe, to teach, and to participate in other activities involving the school and the community. Prerequisite: Admission to the College of Education and Health Professions Teacher Education and CATE Master's program. (Typically offered: Spring)

CATE 5023. Classroom Management. 3 Hours.

(Formerly CATE 4023.) Theory and techniques in classroom management, including professional ethics and school policies related to students, faculty and programs. Graduate degree credit will not be given for both CATE 4023 and CATE 5023. Prerequisite: CATE 3103. (Typically offered: Fall)

CATE 5033. Assessment/Program Evaluation. 3 Hours.

An introduction to constructing, evaluating, and interpreting tests; descriptive and inferential statistics; state competency testing; and guidelines for state program evaluations. Prerequisite: Graduate standing. (Typically offered: Fall)

CATE 5073. Introduction to Teaching Programming in the Secondary Schools. 3 Hours.

(Formerly CATE 4073.) This course provides an introduction to the foundations of teaching methods for computer programming in the secondary schools. Methods of computer programming instruction will include teaching strategies in coding, developing computational thinking, problem-solving skills, and applying key programming concepts. This is an introductory level course. No prerequisites are required. Graduate degree credit will not be given for both CATE 4073 and CATE 5073. Corequisite: Lab component. (Typically offered: Irregular)

CATE 5443. Teaching Career Development in Public Schools. 3 Hours.

This course provides a study of curricula, methods, and techniques involved in teaching career development as related to the 16 occupational clusters. Successful completion of this course is required for licensed teachers to earn their 418 Career Development endorsement. Corequisite: Lab component. (Typically offered: Summer)

CATE 5463. Applications in Career Orientation. 3 Hours.

Student is introduced to various teaching methods and techniques of managing hands-on activities in career orientation class setting. (Typically offered: Summer)

CATE 5503. Trends and Issues in Technology Education. 3 Hours.

A comprehensive technology education methods course pertaining to the teaching of standards-based curriculum materials. (Typically offered: Fall, Spring and Summer)

CATE 5543. Technology for Teaching and Learning. 3 Hours.

A study of computer technology as it relates to teacher education. This course concentrates on knowledge and performance and includes hands-on technology activities that can be incorporated in an educational setting. Students interact with the instructor and other students via BlackBoard and engage in weekly discussions and acquire hands-on computer technology experience. (Typically offered: Fall and Summer)

CATE 5803. Teaching Apparel Production to Secondary Students. 3 Hours.

This course prepares students to teach apparel production concepts to students in secondary school settings. Topics to be covered include clothing selection, textiles, clothing care and laundry, clothing construction, and careers and technology. Problem- and project-based learning will provide the foundation for content delivery in this course. The focus on this course is on preparing preservice teachers in secondary schools to teach apparel production utilizing a variety of teaching methods. Corequisite: Lab component. (Typically offered: Spring)

Cell and Molecular Biology (CEMB) Courses

CEMB 590V. Special Topics in Cell and Molecular Biology. 1-6 Hour.

Consideration of new areas in Cell and Molecular Biology not yet treated adequately in textbooks or in other courses. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CEMB 5911. Seminar in Cell and Molecular Biology. 1 Hour.

Discussion of current topics in Cell and Molecular Biology. All graduate students in the Cell and Molecular Biology degree program must enroll every fall and spring semester in this course or an approved alternate seminar course. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

This course is cross-listed with BIOL 5001.

CEMB 600V. Master's Thesis. 1-6 Hour.

Master's thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CEMB 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Chemical Engineering (CHEG) Courses

CHEG 5013. Membrane Separation and System Design. 3 Hours.

Theory and system design of cross flow membrane process--reverse osmosis, nanofiltration, ultrafiltration, and microfiltration--and applications for pollution control, water treatment, food and pharmaceutical processing. (Typically offered: Irregular)

CHEG 5043. Colloid and Interface Science. 3 Hours.

This course aims to provide essential knowledge about surface, interface, and molecular self-organization. At the end of this course students should understand (i) basic concepts to describe phenomena at surfaces, (ii) molecular self-organization, and (iii) basic techniques for characterization of surfaces and interfaces. (Typically offered: Spring Odd Years)

CHEG 5113. Transport Processes I. 3 Hours.

Fundamental concepts and laws governing the transfer of momentum, mass, and heat. (Typically offered: Fall)

CHEG 5133. Advanced Reactor Design. 3 Hours.

Applied reaction kinetics with emphasis on the design of heterogeneous reacting systems including solid surface catalysis, enzyme catalysis, and transport phenomena effects. Various types of industrial reactors, such as packed bed, fluidized beds, and other non-ideal flow systems are considered. (Typically offered: Spring)

CHEG 5273. Corrosion Control. 3 Hours.

Qualitative and quantitative introduction to corrosion and its control. Application of the fundamentals of corrosion control in the process industries is emphasized. (Typically offered: Spring)

CHEG 5333. Advanced Thermodynamics. 3 Hours.

Methods of statistical thermodynamics, the correlation of classical and statistical thermodynamics, and the theory of thermodynamics of continuous systems (non-equilibrium thermodynamics). (Typically offered: Fall)

CHEG 5353. Advanced Separations. 3 Hours.

Phase equilibrium in non-ideal and multicomponent systems, digital and other methods of computation are included to cover the fundamentals of distillation, absorption, and extraction. (Typically offered: Irregular)

CHEG 5443. Chemical Engineering Design II. 3 Hours.

A capstone design class designed for graduate students who do not have an engineering degree. Responsibility for decision making is placed on the students in the solution of a comprehensive, open ended problem based on an industrial process. Both formal oral and formal written presentation of results are required. Students may not receive credit for both CHEG 4443 and CHEG 5443. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CHEG 5513. Biochemical Engineering Fundamentals. 3 Hours.

An introduction to bioprocessing with an emphasis on modern biochemical engineering techniques and biotechnology. Topics include: basic metabolism (prokaryote and eukaryote), biochemical pathways, enzyme kinetics (including immobilized processes), separation processes (e.g. chromatography) and recombinant DNA methods. Material is covered within the context of mathematical descriptions (calculus, linear algebra) of biochemical phenomenon. (Typically offered: Spring Even Years)

CHEG 5733. Polymer Theory and Practice. 3 Hours.

Theories and methods for converting monomers into polymers are presented. Topics include principles of polymer science, commercial processes, rheology, and fabrication. (Typically offered: Irregular)

CHEG 5773. Medical Applications of Membranes Theory, Current Uses, and Development Areas. 3 Hours.

The course will cover most present-day medical products, treatments, and surgical equipment that rely on membrane transport and/or separation to function effectively. Membranes or membrane devices are used when certain human organs stop working or lose some degree of effectiveness. Those that will be covered in this course include the kidney, the pancreas, the lungs, the skin, and the eye. Localized, controlled-release of medications is also an area where membranes are used in medicine and this area will be described also. Along with dialysis, other external membrane treatment processes such as membrane plasmapheresis (a process whereby a membrane is used to separate blood cells from plasma and thereby opening the door for more effectively treating the cells or plasma separately outside of the body) will be discussed. (Typically offered: Irregular)

CHEG 5801. Graduate Seminar. 1 Hour.

Students hear and present oral presentations on innovations in a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 12 hours of degree credit.

CHEG 588V. Special Problems. 1-6 Hour.

Opportunity for individual study of an advanced chemical engineering problem not sufficiently comprehensive to be a thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CHEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CHEG 6123. Transport Processes II. 3 Hours.

Continuation of CHEG 5113. Prerequisite: CHEG 5113. (Typically offered: Spring)

CHEG 688V. Special Topics in Chemical Engineering. 1-3 Hour.

Advanced study of current Chemical Engineering topics not covered in other courses. Prerequisite: Doctoral students only. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

CHEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Chemistry and Biochemistry (CHEM) Courses

CHEM 505V. Special Topics in Chemistry. 1-4 Hour.

(Formerly CHEM 405V.) Potential topics include: advanced spectroscopic methods, bioanalytical chemistry, bioinorganic chemistry, bioorganic chemistry, biophysical chemistry, chemical sensors, drug discovery and design, nanomaterials, pharmaceutical chemistry, process analytical chemistry, and protein folding and design. Graduate degree credit will not be given for both CHEM 405V and CHEM 505V. Prerequisite: Instructor consent. (Typically offered: Irregular)

CHEM 5101. Introduction to Research. 1 Hour.

This eight week course introduces new graduate students to research opportunities and skills in chemistry and biochemistry. Meets 2 hours per week in the first half of the semester. Safety and ethics in research and scholarship are discussed. Students learn about research programs in the department to aid in choosing an advisor. (Typically offered: Fall)

CHEM 5123. Advanced Inorganic Chemistry. 3 Hours.

Reactions and properties of inorganic compounds from the standpoint of electronic structure and the periodic table. Emphasis on recent developments. Knowledge comparable to material in CHEM 3453 is recommended. (Typically offered: Fall)

CHEM 5143. Advanced Inorganic Chemistry II. 3 Hours.

Chemistry of metallic and non-metallic elements emphasizing molecular structure, bonding and the classification of reactions. Knowledge of inorganic chemistry comparable to material in CHEM 4123 and CHEM 5123 is recommended. (Typically offered: Irregular)

CHEM 5153. Structural Chemistry. 3 Hours.

Determination of molecular structure by diffraction, spectroscopic, and other techniques. Illustrative examples will be chosen from inorganic chemistry and biochemistry. (Typically offered: Irregular)

CHEM 5213. Instrumental Analysis. 3 Hours.

Provides students, especially those in the physical, agricultural, and biological sciences, with an understanding of the theory and practice of modern instrumental techniques of analysis. Lecture 3 hours per week. Knowledge comparable to material in CHEM 2263 and CHEM 3603 is recommended. (Typically offered: Spring)

CHEM 5233. Chemical Separations. 3 Hours.

Modern separation methods including liquid chromatography (adsorption, liquid-liquid partition, ion exchange, exclusion) and gas chromatography. Theory and instrumentation is discussed with emphasis on practical aspects of separation science. Prerequisite: CHEM 4213. (Typically offered: Fall Even Years)

CHEM 5243. Electrochemical Methods of Analysis. 3 Hours.

Topics will include diffusion, electron transfer kinetics, and reversible and irreversible electrode processes followed by a discussion of chronoamperometry, chronocoulometry, polarography, voltammetry, and chronopotentiometry. Knowledge of analytical chemistry comparable to material in CHEM 4213 is recommended. (Typically offered: Spring Even Years)

CHEM 5253. Spectrochemical Methods of Analysis. 3 Hours.

Principles and methods of modern spectroscopic analysis. Optics and instrumentation necessary for spectroscopy is also discussed. Topics include atomic and molecular absorption and emission techniques in the ultraviolet, visible, and infrared spectral regions. Knowledge of analytical chemistry comparable to material in CHEM 4213 is recommended. (Typically offered: Fall Odd Years)

CHEM 5283. Energy Conversion and Storage. 3 Hours.

Fundamental and applied concepts of energy storage and conversion with sustainability implications. Chemical reactions (kinetics, thermodynamics, mass transfer), emphasizing oxidation-reduction, electrochemical, and interfacial processes, and impact on performance of fuel and biofuel cells, batteries, supercapacitors, and photochemical conversion. (Typically offered: Fall Even Years)

CHEM 5383. Chemometrics. 3 Hours.

Chemometrics is the process of extracting relevant information from chemical data by mathematical and statistical tools. These tools allow for designing optimal experimental procedures, extracting important information from complex chemical systems, and better understanding of complex chemical systems. (Typically offered: Spring Even Years)

CHEM 5443. Physical Chemistry of Materials. 3 Hours.

Physical and chemical characteristics of materials and discussion of the science behind materials engineering and performance. Topics include theory, principles of characterization methods, modeling, and applications in the context of materials. Knowledge comparable to material in CHEM 3514 and CHEM 3504 or CHEM 3453 or CHEM 3713 or MEEG 2403 is recommended. (Typically offered: Irregular)

CHEM 5453. Quantum Chemistry I. 3 Hours.

Fundamental quantum theory: Hamiltonian formalism in classical mechanics, Schrodinger equation, operators, angular momentum, harmonic oscillator, barrier problems, rigid rotator, hydrogen atom, and interaction of matter with radiation. Knowledge of physical chemistry comparable to material in CHEM 3504 is recommended. (Typically offered: Spring Odd Years)

CHEM 5473. Chemical Kinetics. 3 Hours.

Theory and applications of the principles of kinetics to reactions between substances, both in the gaseous state and in solution. Knowledge of physical chemistry comparable to material in CHEM 3514 is recommended. (Typically offered: Spring)

CHEM 5573. Statistical Thermodynamics. 3 Hours.

Covers fundamentals in thermodynamics, molecular dynamics, Monte Carlo, phase transitions, behavior of gases and liquids and basic concepts in chemical kinetics and physical kinetics. Knowledge comparable to physical chemistry materials in CHEM 3514 is recommended. (Typically offered: Irregular)

CHEM 5603. Physical Organic Chemistry. 3 Hours.

Introduction to the theoretical interpretation of reactivity, reaction mechanisms, and molecular structure of organic compounds. Application of theories of electronic structure; emphasis on recent developments. Knowledge of material comparable to CHEM 3613, CHEM 3613H, CHEM 3713 and CHEM 3514 is recommended. (Typically offered: Fall)

CHEM 5633. Organic Reactions. 3 Hours.

The more important types of organic reactions and their applications to various classes of compounds. Knowledge of organic chemistry comparable to material in CHEM 3603 is recommended. (Typically offered: Irregular)

CHEM 5723. Experimental Methods in Organic Chemistry. 3 Hours.

Introduction to the application of synthetic and spectroscopic methods in organic chemistry, including mass spectrometry, infrared spectroscopy, and nuclear magnetic resonance spectrometry. Lecture 3 hours per week. Knowledge comparable to material in CHEM 3613 is recommended. (Typically offered: Fall)

CHEM 5753. Methods of Organic Analysis. 3 Hours.

Interpretation of physical measurements of organic compounds in terms of molecular structure. Emphasis on spectroscopic methods (infrared, ultraviolet, magnet resonance, and mass spectra). Knowledge of organic chemistry comparable to material in CHEM 3603 is recommended. (Typically offered: Fall)

CHEM 5813. Biochemistry I. 3 Hours.

The first of a two-course series covering biochemistry for graduate students in biology, agriculture, and chemistry. Topics covered include protein structure and function, enzyme kinetics, enzyme mechanisms, and nucleic acid and carbohydrate structures. Knowledge of organic chemistry comparable to material in CHEM 3613 is recommended. (Typically offered: Fall)

CHEM 5843. Biochemistry II. 3 Hours.

A continuation of CHEM 5813 covering topics including biological membranes and bioenergetics, photosynthesis, lipids and lipid metabolism, nucleic acid and amino acid metabolism, and molecular biology. Knowledge of organic chemistry comparable to material in CHEM 3613 is recommended. Prerequisite: CHEM 5813. (Typically offered: Spring)

CHEM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Chemistry graduate students enroll in this course as needed until all CUMES are passed and the student is officially a doctoral candidate. Prerequisite: Chemistry graduate student. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CHEM 6011. Chemistry Seminar. 1 Hour.

Weekly discussion of current chemical research. Departmental and divisional seminars in analytical chemistry, biochemistry, inorganic, organic, and physical chemistry are held weekly. Seminar credit does not count toward the minimum hourly requirements for any chemistry graduate degree. (Typically offered: Fall and Spring) May be repeated for degree credit.

CHEM 619V. Special Topics in Inorganic Chemistry. 1-3 Hour.

Topics which have been covered in the past include: technique and theory of x-ray diffraction, electronic structure of transition metal complexes, inorganic reaction mechanisms, and physical methods in inorganic chemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 6283. Mass Spectrometry. 3 Hours.

This course is devoted to the fundamental principles and applications of analytical mass spectrometry. Interactions of ions with magnetic and electric fields and the implications with respect to mass spectrometer design are considered, as are the various types of mass spectrometer sources. Representative applications of mass spectrometry in chemical analysis are also discussed. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years)

CHEM 629V. Special Topics in Analytical Chemistry. 1-3 Hour.

Topics that have been presented in the past include: electroanalytical techniques, kinetics of crystal growth, studies of electrode processes, lasers in chemical analysis, nucleosynthesis and isotopic properties of meteorites, thermoluminescence of geological materials, early solar system chemistry and analytical cosmochemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 649V. Special Topics in Physical Chemistry. 1-3 Hour.

Topics which have been covered in the past include advanced kinetics, solution chemistry, molecular spectra, nuclear magnetic resonance spectroscopy, and methods of theoretical chemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 6633. Chemistry of Organic Natural Products. 3 Hours.

Selected topics concerned with structure elucidation and synthesis of such compounds as alkaloids, antibiotics, bacterial metabolites, plant pigments, steroids, terpenoids, etc. Prerequisite: CHEM 5603 and CHEM 5633. (Typically offered: Irregular)

CHEM 6643. Organometallic Chemistry. 3 Hours.

Theories and principles of organometallic chemistry. Concepts include bonding, stereochemistry, structure and reactivity, stereochemical principles, conformational, steric and stereoelectronic effects. Transition metal catalysis of organic reactions will also be described. Knowledge of material comparable to CHEM 3713 and CHEM 3514 is recommended. (Typically offered: Irregular)

CHEM 669V. Special Topics in Organic Chemistry. 1-3 Hour.

Topics which have been presented in the past include heterogeneous catalysis, isotope effect studies of organic reaction mechanisms, organometallic chemistry, stereochemistry, photochemistry, and carbanion chemistry. (Typically offered: Irregular) May be repeated for degree credit.

CHEM 6823. Physical Biochemistry. 3 Hours.

Physical chemistry of proteins, nucleic acids, and biological membranes. Ultracentrifugation, absorption and fluorescent spectrophotometry, nuclear magnetic resonance spectroscopy, x-ray diffraction, and other techniques. Prerequisite: CHEM 5813. (Typically offered: Fall Even Years)

CHEM 6863. Enzymes. 3 Hours.

Isolation, characterization, and general chemical and biochemical properties of enzymes. Kinetics, mechanisms, and control of enzyme reactions. Prerequisite: CHEM 5813 and CHEM 5843. (Typically offered: Fall Odd Years)

CHEM 6873. Molecular Biochemistry. 3 Hours.

Nucleic acid chemistry in vitro and in vivo, synthesis of DNA and RNA, genetic diseases, cancer biochemistry and genetic engineering. Prerequisite: CHEM 5813 and CHEM 5843. (Typically offered: Spring Odd Years)

CHEM 6883. Bioenergetics and Biomembranes. 3 Hours.

Cellular energy metabolism, photosynthesis, membrane transport, properties of membrane proteins, and the application of thermodynamics to biological systems. Prerequisite: CHEM 5813 and CHEM 5843. (Typically offered: Spring Even Years)

CHEM 700V. Doctoral Dissertation. 1-12 Hour.

Doctoral Dissertation. For chemistry graduate students who have passed all CUMES and have officially been admitted to doctoral candidacy. Prerequisite: Chemistry graduate student. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Civil Engineering (CVEG) Courses

CVEG 5000. Graduate Seminar in Civil Engineering. 0 Hours.

A weekly seminar devoted to civil engineering research topics. Appropriate grade to be 'S'. (Typically offered: Fall and Spring)

CVEG 5103. Geosynthetic Applications in Civil Engineering. 3 Hours.

Geosynthetic Applications in Civil Engineering: The functional properties of various geosynthetic materials are defined as they relate to; reinforcement, separation, filtration, and drainage applications. Design procedures are developed for the use of geosynthetics in transportation, environmental and geotechnical applications. Prerequisite: CVEG 3132 and CVEG 3131L or equivalent. (Typically offered: Irregular)

CVEG 5113. Soil Dynamics. 3 Hours.

This course covers propagation of stress waves in elastic and inelastic materials, dynamic loading of soils, and stiffness and damping properties of soils. Use of field and laboratory techniques to determine shear wave velocity of soils. Also includes applications of dynamic soil properties in site stiffness characterization, geotechnical earthquake engineering, evaluation of ground improvement, and design of machine foundations. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5123. Measurement of Soil Properties. 3 Hours.

Consideration of basic principles involved in measuring properties of soils. Detailed analysis of standard and specialized soil testing procedures and equipment. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5133. Geotechnical Site Characterization. 3 Hours.

One of primary tasks of geotechnical engineers is to perform in-situ site characterization for engineering design of foundations, retaining structures, roads, bridges and other infrastructure. This course will focus on in-situ investigations performed for the purpose of collecting detailed site characterization data for direct and/or indirect use in geotechnical design. Specifically, we will study various static (e.g., SPT, CPT, VST, DMT, PMT) and dynamic (e.g., CHT, DHT, SW, GPR) in-situ tests used to obtain estimates of stratigraphy, density, strength, stress history, modulus, and permeability of geotechnical materials. We will predominantly focus on site characterization of soil sites, but will mention rock testing and design methods when appropriate. Prerequisite: CVEG 4143 or the equivalent. (Typically offered: Irregular)

CVEG 5143. Transportation Soils Engineering. 3 Hours.

Advanced study of the properties of surficial soils; soil classification systems; pedology; soil occurrence and variability; subgrade evaluation procedures; repeated load behavior of soils; soil compaction and field control; soil stabilization; soil trafficability and subgrade stability for transportation facilities. Prerequisite: CVEG 3132. (Typically offered: Irregular)

CVEG 5153. Earth Retaining Structures. 3 Hours.

This course will focus on the analysis and design of earth retaining structures. Specifically, we will discuss soil and rock property design parameter selection, lateral earth pressures for wall system design, and load and resistance factor design (LRFD) for retaining walls. Wall types discussed include gravity and semi-gravity walls, modular gravity walls, MSE walls, nongravity cantilever walls and anchored walls, and in-situ reinforced walls. Information on wall system feasibility and selection, construction materials and methods, cost information, and design and performance information will be discussed. Prerequisite: CVEG 4143 or equivalent. (Typically offered: Irregular)

CVEG 5163. Seepage and Consolidation. 3 Hours.

Investigation of the flow of water through soils and the time rate of compression of soils. Characterization of the hydraulic conductivity of soils in the field, seepage through earth dams, excavation cut-off walls, and other seepage control systems. Analytical and experimental investigations of soil volume change under hydraulic and mechanical loading. Design of earth and rock dams, well pumping, and vertical and radial consolidation in embankments. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5173. Advanced Foundations. 3 Hours.

Study of soil-supported structures. Topics include drilled piers, slope stability, pile groups, negative skin friction, foundation design from the standard penetration test and Dutch cone, and other specialized foundation design topics. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5183. Geo-Environmental Engineering. 3 Hours.

Study of the geotechnical aspects of waste containment systems and contaminant remediation applications. Analysis and measurement of flow of water and contaminants through saturated and unsaturated soils, clay mineralogy and soil-chemical compatibility, and mechanical and hydraulic behavior of geomembranes, geotextiles, and geosynthetic clay liners. Design and construction aspects of compacted clay and composite landfill liners, drainage systems, and landfill covers. Prerequisite: CVEG 3132 or graduate standing. (Typically offered: Irregular)

CVEG 5193. Geotechnical Earthquake Engineering. 3 Hours.

This course covers stress wave propagation in soil and rock; influence of soil conditions on seismic ground motion characteristics; evaluation of site response using wave propagation techniques; liquefaction of soils; seismic response of earth structures and slopes. Prerequisite: CVEG 4143 or graduate standing. (Typically offered: Irregular)

CVEG 5203. Water Chemistry. 3 Hours.

This course provides a basis for applying principles of physical chemistry to understanding the composition of natural waters and to the engineering of water and wastewater treatment processes. Topics covered include chemical equilibrium (algebraic, graphical, and computer-aided solution techniques); acid-base equilibria and buffering; oxidation and reduction reactions; and solid precipitation and dissolution. Prerequisite: Graduate standing or CVEG 3243 and instructor approval. (Typically offered: Spring)

CVEG 5213. Advanced Water Treatment Design. 3 Hours.

Design of industrial and municipal water treatment plants. Discussion of raw and treated water requirements for several uses. Prerequisite: CVEG 3243. (Typically offered: Spring)

CVEG 5224. Advanced Wastewater Treatment Design. 4 Hours.

Application of advanced techniques for the analysis of wastewater treatment facilities. Physical, chemical and biological processes for removing suspended solids, organics, nitrogen, and phosphorus. Laboratory treatability studies will be used to develop design relationships. Lecture 3 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CVEG 4243 or graduate standing. (Typically offered: Fall)

CVEG 5233. Microbiology for Environmental Engineers. 3 Hours.

Fundamental and applied aspects of microbiology and biochemistry relating to water quality control, wastewater treatment, and stream pollution. Prerequisite: CVEG 3243. (Typically offered: Irregular)

CVEG 5243. Groundwater Hydrology. 3 Hours.

Detailed analysis of groundwater movement, well hydraulics, groundwater pollution and artificial recharge. Surface and subsurface investigations of groundwater and groundwater management, saline intrusion and groundwater modeling will be addressed. Prerequisite: CVEG 3223. (Typically offered: Irregular)

CVEG 5253. Physical-Chemical Processes for Water and Wastewater Treatment. 3 Hours.

This course provides a fundamental understanding of physical and chemical processes used in the treatment of drinking water and wastewater. Principles of mass balance are applied to understand the impact of reactor hydraulics (ideal and non-ideal flow) and reaction kinetics on process performance and identify important process variables. Chemical processes covered include disinfection, gas transfer, adsorption, and ion exchange; physical processes covered include coagulation, flocculation, sedimentation, filtration, and membranes. Prerequisite: Graduate standing and instructor consent. (Typically offered: Fall Odd Years)

CVEG 5273. Open Channel Flow. 3 Hours.

Open Channel Flow includes advanced open channel hydraulics, flow measurement techniques, a hydrology review, culvert and storm drainage facility design, natural channel classification (fluvial geomorphology) and rehabilitation, computer methods and environmental issues. Prerequisite: CVEG 3213 and CVEG 3223. (Typically offered: Irregular)

CVEG 5293. Water Reuse. 3 Hours.

CVEG 5293 is a graduate-level course that discusses topics related to water reclamation and reuse. Topics include past and current practices of water reuse, health and environmental issues related to water reuse, water technologies and systems for water reuse, and water reuse applications. Prerequisite: CVEG 3243 or equivalent course. (Typically offered: Spring Even Years)

CVEG 5303. Theory of Stability. 3 Hours.

Study of structural members subjected to compression. Analysis of compression members considering support conditions and within frame configurations. Analysis of beams considering lateral torsional buckling. AISC Steel Manual strength equations related to columns and beams are derived and discussed. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5313. Matrix Analysis of Structures. 3 Hours.

Energy and digital computer techniques of structural analysis as applied to conventional forms, space trusses, and frames. Prerequisite: CVEG 3303 or graduate standing. (Typically offered: Irregular)

CVEG 5323. Structural Dynamics. 3 Hours.

Dynamics response of single and multidegree of freedom systems. Modal analysis. Response spectra. Computer programs for dynamic analysis. Design considerations for structures subjected to time-varying forces including earthquake, wind, and blast loads. Prerequisite: CVEG 3303. (Typically offered: Irregular)

CVEG 5333. Concrete Materials. 3 Hours.

Topics include portland cement production, supplementary cementing materials, fresh and hardened concrete properties, mixture proportioning, chemical admixtures, curing, and specialty concretes. Corequisite: Lab component. Prerequisite: CVEG 4303. (Typically offered: Irregular)

CVEG 5343. Highway Bridges. 3 Hours.

Economics of spans, current design and construction specifications, comparative designs. Possible refinements in design techniques and improved utilization of materials. Prerequisite: CVEG 4313 and CVEG 4303. (Typically offered: Irregular)

CVEG 5353. Prestressed Concrete Design. 3 Hours.

Analysis and design of prestressed concrete beams. Topics include flexural analysis, prestress bond, draping and debonding, allowable stresses, shear analysis and design, camber prediction, and prestress losses. Prerequisite: CVEG 4303. (Typically offered: Irregular)

CVEG 5363. Advanced Topics in Reinforced Concrete. 3 Hours.

Analysis and design of reinforced concrete members. Topics include slender columns, one-way and two-way slab design, strut and tie design, and torsion. Prerequisite: CVEG 4303 or graduate standing. (Typically offered: Irregular)

CVEG 5373. Advanced Structural Steel Design. 3 Hours.

Design of structural steel components using the Load and Resistance Factor Design method. Intensive treatment of simple and eccentric connections, composite construction, plate girders, and plastic analysis and design. Prerequisite: CVEG 4313 or graduate standing. (Typically offered: Irregular)

CVEG 5383. Finite Element Methods in Civil Engineering. 3 Hours.

An understanding of the fundamentals of the finite element method and its application to structural configurations too complicated to be analyzed without computer applications. Application to other areas of civil engineering analysis and design such as soil mechanics, foundations, fluid flow, and flow through porous media. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5393. Advanced Strength of Materials. 3 Hours.

The course will continue from the basic material addressed in the undergraduate course and investigate in more detail stress analysis as it pertains to civil engineering type problems. Topics addressed in the course will include stress analysis (two-dimensional), constitutive relationships, solutions for two-dimensional problems, flexure, torsion, beams on elastic foundations, and energy methods. Prerequisite: CVEG 2023 or MEEG 3013. (Typically offered: Irregular)

CVEG 5413. Transportation and Land Development. 3 Hours.

Study of interaction between land development and the transportation network. Application of planning, design, and operational techniques to manage land development impacts upon the transportation system, and to integrate land layout with transportation network layout. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5423. Structural Design of Pavement Systems. 3 Hours.

An introduction to the structural design of pavement systems including: survey of current design procedures; study of rigid pavement jointing and reinforcement practices; examination of the behavioral characteristics of pavement materials and of rigid and flexible pavement systems; introduction to structural analysis theories and to pavement management concepts. Prerequisite: CVEG 4433. (Typically offered: Irregular)

CVEG 5433. Traffic Engineering. 3 Hours.

A study of both the underlying theory and the use of traffic control devices (signs, traffic signals, pavement markings), and relationships to improved traffic flow and safety, driver and vehicle characteristics, geometric design, and societal concerns. Also includes methods to collect, analyze, and use traffic data. Prerequisite: CVEG 3413 or graduate standing. (Typically offered: Irregular)

CVEG 5463. Transportation Modeling. 3 Hours.

The use of mathematical techniques and/or computer software to model significant transportation system attributes. May compare model results with actual measured traffic attributes, using existing data sources and/or collecting and analyzing field data. Pre- or Corequisite: Lab component. Prerequisite: Graduate standing. (Typically offered: Irregular)

CVEG 5503. Construction Safety. 3 Hours.

Construction industry safety management systems, practices, and research to prevent injuries on work sites. Roles, responsibilities, and interaction of construction industry participants in safety management. OSHA organization, regulation framework, and resources. Safety program procedures and practices associated with positive safety performance outcomes. Total cost of injuries to include personal, direct/indirect costs, and workers compensation insurance. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5513. Construction Scheduling. 3 Hours.

Develop an understanding of modern scheduling techniques used for the management of construction projects. Learn the underlying logical principles, calculation methods, and presentation formats for PDM, the most prevalent technique. Load schedules with resources and costs to enable leveling, smoothing, and earned value analysis. Learn to update schedules for actual progress, identify problems, and compress or crash activities. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5523. Construction Productivity. 3 Hours.

This course introduces the student to construction industry productivity measurement, management practices, planning processes, and work methods to improve labor productivity on project sites. Factors that influence labor productivity such as resource supply chain, rework, changes, craft labor motivation, and the workforce environment are included. Roles, responsibilities, and interaction of construction industry participants in productivity management will be examined. Participants will learn construction productivity improvement program tools associated with improved productivity performance including work sampling and activity analysis. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5533. Legal Aspects of Construction. 3 Hours.

Students will identify legal issues in the course of a construction project and learn to determine when and where they or their employers or clients need legal advice. The course covers the most common legal considerations and disputes that arise in the construction and design industries from the perspectives of different industry participants, and it explores the most important contractual terms commonly used in construction industry agreements. The individual lessons address basic aspects of the legal system, liability for negligence and professional malpractice, and a full range of legal risk allocation and risk management strategies, relating to: bidding and proposal practices; project delivery systems; contracting practices; insurance; surety bonds; pricing, scheduling, and payment disputes; contract administration; legal remedies; and alternative dispute resolution methods. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5543. Sustainability in Construction Management. 3 Hours.

Sustainability in Construction Management will explore traditional concepts of construction management through the lens of sustainability. Topics covered will include elements of sustainable design and construction, sustainable project requirements and management, choosing materials and production, sustainability design and construction economics, understanding specifications, community participation, waste management, regulatory agencies, and worker safety and roles. These topics will be viewed through the lens of the three pillars of sustainability: economics, environmental, and social. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer)

CVEG 5553. Risk and Financial Management in Construction. 3 Hours.

This course prepares students to understand the differences between financial management in a construction company versus financial management in other industries. The course will also teach students how to account for a construction company's financial resources. The students will then learn how to quantitatively analyze financial decisions. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CVEG 5563. Building Information Modeling (BIM) for Design and Construction. 3 Hours.

This course provides students with a comprehensive overview of building information modeling (BIM) within the context of multiple project delivery methods and from the different perspectives of owners, architects/engineers and contractors/subcontractors. The course includes 'hands-on' experiences using BIM software (Autodesk Revit) and will provide students with a basic working knowledge of the software. The curriculum also covers a systems perspective of how BIM works in different contractual relationships and workflows. Finally, the course will provide students with an understanding of how to implement BIM for companies that have not already done so. The course culminates with a student-modeled project in BIM, in conjunction with a real-world example in how your company can implement BIM. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CVEG 562V. Research. 1-6 Hour.

Fundamental and applied research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CVEG 563V. Special Problems. 1-6 Hour.

Special problems in CVEG. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CVEG 5863. Fundamentals of Sustainability in Civil Engineering. 3 Hours.

Qualify and quantify the economic, environmental, societal and engineering drivers behind sustainability in Civil Engineering. Justification of the feasibility and benefits of sustainability in environmental, geotechnical, structural and transportation through verbal and written communications. Students cannot receive credit for both CVEG 4863 and CVEG 5863. Prerequisite: Graduate standing or instructor consent. (Typically offered: Irregular)

CVEG 5953. Fundamentals of Fracture and Fatigue in Structures. 3 Hours.

The course will cover the concepts of linear-elastic, elastic-plastic and time-dependent Fracture Mechanics as applied to fracture in a variety of materials, structures, and operating conditions. The examples will include fracture in large components such as aircraft, bridges and pressure vessels and also in bones and in soft materials and human tissue. Prerequisite: Graduate standing in Civil, Mechanical or Biomedical Engineering or consent of the instructor. (Typically offered: Fall)

This course is cross-listed with BMEG 5953, MEEG 5953.

CVEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CVEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Communication (COMM)

Courses

COMM 5111. Colloquium in Communication Research. 1 Hour.

Presentation, evaluation, and discussion of research proposals or on-going research projects. Graduate students are required to register for this course each semester of residence. (Typically offered: Fall and Spring) May be repeated for degree credit.

COMM 5123. Quantitative Research Methods in Communication. 3 Hours.

Emphasizes the assumptions and procedures of social scientific research methods in communication. (Typically offered: Fall)

COMM 5133. Media Processes & Effects. 3 Hours.

Introduction to scholarly research and theory in media processes and effects. Particular attention will be devoted to the impact of media messages on individuals and societies. Emphasis will be placed on the construction and development of theory. (Typically offered: Fall)

COMM 5163. Introduction to Communication Paradigms. 3 Hours.

Introduces the variety of modes of inquiry used in communication. Reviews the field's history and boundaries. Explores contemporary communication research. (Typically offered: Fall)

COMM 5173. Qualitative Methods in Communication. 3 Hours.

Emphasizes the assumptions and procedures of qualitative research methods in the examination of human communication behavior. (Typically offered: Spring)

COMM 5183. Interpretive Research Methods in Communication. 3 Hours.

Examines various perspectives used to analyze and critique various texts (e.g., media programming, speeches). (Typically offered: Spring)

COMM 5193. Seminar in Communication. 3 Hours.

Research, discussion, and papers focus on one of a variety of communication topics including symbolic processes in communication, philosophy of rhetoric, communication education, criticism of contemporary communication, interpersonal communication, organizational communication, and contemporary applications of rhetoric. Maximum credit is 9 semester hours. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

COMM 5323. Seminar in Persuasion. 3 Hours.

Focus is on comparing theoretical accounts of persuasion and research evidence concerning the effects of various factors on persuasion. (Typically offered: Fall)

COMM 5333. Interpersonal Communication Theory. 3 Hours.

Survey of the theoretical orientations in interpersonal communication with primary focus on conceptual, philosophical and research issues. (Typically offered: Fall Even Years)

COMM 5343. Interpersonal Communication. 3 Hours.

Theory and research concerning the exchange of information and the mutual influencing of behavior among people. Prerequisite: Graduate standing. (Typically offered: Fall)

COMM 5353. Rhetorical Criticism. 3 Hours.

A seminar in rhetorical criticism. A study of the development of standards of rhetorical appraisal from the foundations of the art of speaking to the modern period; examination of contemporary approaches to rhetorical appraisal and practice in critical analysis of contemporary address. (Typically offered: Irregular)

COMM 5373. Content Analysis. 3 Hours.

Techniques for observing and analyzing the overt communication behavior of selected communicators. Prerequisite: Graduate standing. (Typically offered: Irregular)

COMM 5383. Seminar in Political Communication. 3 Hours.

Research seminar focusing on selected topics such as candidate imagery, diffusion of political information, or political symbolism. Prerequisite: Graduate standing. (Typically offered: Irregular)

This course is cross-listed with PLSC 5383.

COMM 5403. Organizational Communication Theory. 3 Hours.

A seminar on the historical development of theory and research into communication processes occurring within an organizational setting. Lecture, discussion, oral and written reports. Prerequisite: Graduate standing. (Typically offered: Irregular)

COMM 5463. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall) This course is cross-listed with WLLC 5463, ANTH 5473, ENGL 5463.

COMM 5473. Treatment of Native Americans in Film. 3 Hours.

Compares the treatment of Native Americans in film with how representatives of this group identify themselves. Will also focus on motion pictures relating to Native Americans produced by indigenous filmmakers. (Typically offered: Irregular)

COMM 5503. Communication and Cultural Studies. 3 Hours.

Examinations of the role of communication in modern culture. Emphasis is upon the production and circulation of meanings with society, and special attention is given to the role of popular and mass media in this process. Prerequisite: Graduate standing. (Typically offered: Fall)

COMM 5513. Sustainability and Communication. 3 Hours.

Communication's role in creating and conveying an organization's environmental sustainability philosophy and initiatives. Discusses internal communication when establishing and communicating sustainability goals and initiatives. Covers communicating sustainability to external groups through websites, sustainability reports, and advocacy initiatives. For profit, nonprofit, governmental, NGOs, and/or advocacy organizations discussed. (Typically offered: Fall Even Years)

COMM 5533. Family Communication. 3 Hours.

An exploration of the major theories and lines of research that examine family communication in contemporary American life. (Typically offered: Fall Even Years)

COMM 569V. Seminar in Film Studies. 1-3 Hour.

Research, discussion; papers on a variety of film genres and areas including the new American film, the science-fiction film, directors, film comedy, the experimental film, criticism, and the film musical. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

COMM 5763. Health Communication. 3 Hours.

Examines the difficulties of effective communication between health care providers and recipients including the following: issues of social support, conveying bad news, cultural issues, and identifying relevant communication skills associated with effective health care provision. Explores medical education models for training in effective patient-provider communication. (Typically offered: Irregular)

COMM 5823. Political Communication. 3 Hours.

Covers contemporary political communication theory and applies them to understand modern political campaigns. Topics covered include the rhetoric of politics, political advertising, the role of the media and public opinion, the impact of new technology, campaign speech genres, political debates, and the role of social identity in presidential campaigns. (Typically offered: Irregular)

COMM 5833. The Rhetoric of the Modern American Presidency. 3 Hours.

Study contemporary presidents' reliance on public persuasion, especially in efforts to bypass Congress and accomplish complicated political goals. Explore the origins of the concept of the 'rhetorical presidency,' specifically how it developed and changed the nature of the executive branch of government. Examine major genres of modern presidential rhetoric illustrating that trend. (Typically offered: Irregular)

COMM 5843. Legal Communication. 3 Hours.

Examines communication processes in the legal environment and focuses on communication skills and behaviors among judges, attorneys, litigants, and jurors. Particular attention will be given to verbal strategies and nonverbal messages related to interviews, negotiation, mediation, and litigation and to the rhetorical functions of legal pleadings and judicial opinions. (Typically offered: Irregular)

COMM 5853. American Film Survey. 3 Hours.

A survey of major American film genres, major directors and films that have influenced the development of motion pictures. (Typically offered: Fall and Summer)

COMM 5863. History and Development of International Film I. 3 Hours.

A critical survey of international film as a distinctive art form and as a medium of expression and communication with attention given to films and cinema from its origins to 1975. (Typically offered: Irregular)

COMM 5873. History and Development of International Film II. 3 Hours.

A critical survey of international film as a distinctive art form and as a medium of expression and communication with attention given to films and cinema from 1975 to the present. (Typically offered: Irregular)

COMM 590V. Special Problems. 1-6 Hour.

Credit by arrangement. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

COMM 5913. Internship in Communication. 3 Hours.

Internship in applied communication within public and private organizations. Prerequisite: 15 hours graduate level communication in residence. (Typically offered: Fall, Spring and Summer)

COMM 5923. Capstone Course in Communication. 3 Hours.

Students organize and synthesize knowledge developed throughout their graduate coursework into a tangible capstone product which becomes part of their professional portfolio. (Typically offered: Fall, Spring and Summer)

COMM 5993. Readings In Cultural Studies. 3 Hours.

Classic and current theoretical approaches to cultural studies. Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular)

COMM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

Communication Sciences and Disorders (CDIS) Courses

CDIS 5103. Research Methodology in Communication Disorders. 3 Hours.

An examination of methods of research in speech-language pathology and audiology and of the use of bibliographic tools. Focuses on purposes and problems of various forms of communication disorders research, procedures and instruments employed, and reporting of research. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5113. Seminar in Early Intervention. 3 Hours.

Study of a family-centered, transdisciplinary approach to early intervention with infants and toddlers at-risk for communication disorders. Topics include early communication development, service delivery in a family context, coordination with other disciplines, legislation mandating services, and providing services to children with multiple disabilities. Prerequisite: CDIS 3223 or equivalent, and graduate standing. (Typically offered: Spring)

CDIS 5121L. Feeding and Swallowing Disorders Lab. 1 Hour.

Observation and interpretation of techniques used for assessment and remediation of feeding and swallowing disorders in children and adults. Prerequisite: Enrollment in CDISMS program or Instructor Consent. (Typically offered: Fall)

CDIS 5122. Feeding and Swallowing Disorders. 2 Hours.

Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children and adults. Prerequisite: Enrollment in CDISMS program or Instructor Consent. (Typically offered: Fall)

CDIS 5143. Cognitive-Communication Development and Disorders. 3 Hours.

Study of normal cognitive development, the role of communication in this development, and shifts that may occur in conjunction with various speech, language and/or hearing disorders. Prerequisite: CDIS 3223. (Typically offered: Fall)

CDIS 5153. TBI and Right-Hemisphere Disorders. 3 Hours.

Study of the speech and language disorders commonly resulting from traumatic brain injury and right hemisphere disorders. Prerequisite: Enrollment in CDISMS program or instructor consent. (Typically offered: Spring)

CDIS 5173. Sign Language and Deafness. 3 Hours.

(Formerly CDIS 4103.) An introduction to American Sign Language (ASL) and the Deaf Community that uses it. This class will study expressive and sign language skills using ASL vocabulary, structure and grammar. The Deaf Community will be studied through videotapes and readings. Issues in Deaf Education will also be introduced. Graduate degree credit will not be given for both CDIS 4103 and CDIS 5173. (Typically offered: Fall, Spring and Summer)

CDIS 5183. Advanced Clinical Practicum I. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5203. Introduction to Aural Rehabilitation. 3 Hours.

(Formerly CDIS 4133.) Study of the technique used in the rehabilitation of speech and language problems of the hearing impaired including the role of amplification, auditory training, and speech reading in rehabilitation. Graduate degree credit will not be given for both CDIS 4133 and CDIS 5203. Prerequisite: CDIS 3103. (Typically offered: Spring)

CDIS 5213. Voice and Resonance Disorders. 3 Hours.

Study of disorders of phonation and resonance, including etiologies, diagnosis, and intervention strategies. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5223. Fluency Disorders. 3 Hours.

An examination of fluency disorders including theory, etiological factors, and development. In addition, the course is designed to address assessment and management of fluency disorders consistent with evidence-based practice for prospective speech-language pathologists. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5233. Speech Sound Disorders. 3 Hours.

Assessment and treatment of disorders in speech articulation. Prerequisite: Graduate standing. (Typically offered: Summer)

CDIS 5243. Language Disorders in Adults. 3 Hours.

Cognitive and communicative breakdown due to neurological trauma, including etiology, characteristics, assessment and treatment for aphasia, traumatic brain injury, and right hemisphere disorders. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 5253. Motor Speech Disorders. 3 Hours.

Study of motor speech production disorders related to damage to central or peripheral nervous system motor centers and pathways. Cerebral palsy, adult dysarthria, apraxia, and dysphagia are emphasized. Both theoretical and treatment considerations are addressed. Prerequisite: Enrollment in the Communication Sciences and Disorders Master of Science (CDISMS) program or instructor consent. (Typically offered: Spring)

CDIS 5263. Advanced Audiology. 3 Hours.

(Formerly CDIS 4263.) Study of the basic techniques used in audiological assessment of children and adults, including pure tone audiometry, speech audiometry, and special tests of hearing function. Graduate degree credit will not be given for both CDIS 4263 and CDIS 5263. Prerequisite: CDIS 3103. (Typically offered: Fall)

CDIS 5273. Language, Learning and Literacy. 3 Hours.

An examination of language-based literacy skills, including consideration of development, disorders, assessment and intervention. Prerequisite: Enrollment in CDISMS program or instructor consent. (Typically offered: Summer)

CDIS 5283. Advanced Clinical Practicum II. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing and CDIS 5183. (Typically offered: Spring)

CDIS 5293. Augmentative and Alternative Communication. 3 Hours.

Approaches to communication management with the severely and profoundly handicapped child or adult, with primary emphasis on augmentative and alternative communication assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5303. Clinical Assessment of Speech and Language Disorders. 3 Hours.

(Formerly CDIS 4183.) Study of the basic diagnostic procedures used in speech-language pathology. Emphasis is placed on the clinical processes of assessment, including criteria for test selection, techniques in test administration, and interpretation of test. Graduate degree credit will not be given for both CDIS 4183 and CDIS 5303. Pre- or Corequisite: Prior coursework in CDIS and ANTH 1023. (Typically offered: Spring)

CDIS 5313. Introduction to Speech and Hearing Science. 3 Hours.

(Formerly CDIS 4213.) Study of the acoustic structure of oral speech and the auditory skills underlying speech perception. Graduate degree credit will not be given for both CDIS 4213 and CDIS 5313. Prerequisite: CDIS 3203, CDIS 3213, CDIS 3124 and its lab component. Pre- or Corequisite: MATH 1203 or higher. (Typically offered: Spring)

CDIS 5323. Language Disorders in Children. 3 Hours.

(Formerly CDIS 4223.) Study of disorders of language acquisition and usage in children and adolescents, with emphasis upon the nature, assessment, and treatment of such disorders. Graduate degree credit will not be given for both CDIS 4223 and CDIS 5323. Prerequisite: CDIS 3223. (Typically offered: Spring)

CDIS 5353. Neurological Bases of Communication. 3 Hours.

(Formerly CDIS 4253.) A study of the structures and functions of the central and peripheral nervous systems as they relate to human speech, language, and cognition. Graduate degree credit will not be given for both CDIS 4253 and CDIS 5353. Prerequisite: Enrollment in the Communication Sciences and Disorders Master of Science (CDISMS) program or Instructor Consent. (Typically offered: Fall)

CDIS 5373. Communication Behavior and Aging. 3 Hours.

(Formerly CDIS 4273.) Study of the effects upon communication of normal aspects of the aging process, from early adulthood throughout the lifespan. Changes in speech, language, and hearing functioning are identified; common alterations in communicative disorders commonly associated with advanced age are discussed. Graduate degree credit will not be given for both CDIS 4273 and CDIS 5373. (Typically offered: Fall)

CDIS 5383. Advanced Clinical Practicum III. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing and CDIS 5283. (Typically offered: Summer)

CDIS 5391. Clinical Practicum: Hearing Disorders. 1 Hour.

Practicum in audiology. (Typically offered: Fall, Spring and Summer)

CDIS 5443. Advanced Clinical Practicum IV. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing, CDIS 5183, CDIS 5283, and CDIS 5383. (Typically offered: Fall)

CDIS 548V. Off-Campus Practicum: Public School Site. 1-6 Hour.

Practicum activities in speech-language disorders in a public school setting. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CDIS 5511. Professional Issues I. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Fall)

CDIS 5521. Professional Issues II. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Spring)

CDIS 5531. Professional Issues III. 1 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Graduate standing in communication disorders. (Typically offered: Fall)

CDIS 558V. Internship: Clinical Site. 3-6 Hour.

Field placement in approved clinical setting for clock hours in speech-language pathology assessment and treatment. Students in the master's program must enroll in a minimum of 3 credit hours of CDIS 558V or CDIS 578V during their last semester of graduate studies. Prerequisite: Graduate standing; Completion of one semester of either CDIS 548V or CDIS 568V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 5663. Advanced Clinical Practicum V. 3 Hours.

Practicum activities in speech-language assessment and intervention. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 568V. Off-Campus Practicum: Clinical Site. 1-6 Hour.

Practicum activities in speech-language disorders in an off-campus clinical site. Prerequisite: Graduate standing, CDIS 5183, CDIS 5283, and CDIS 5383. (Typically offered: Fall, Spring and Summer)

CDIS 578V. Internship: Public School Site. 3-6 Hour.

Field placement in approved public school setting for clock hours in speech-language pathology assessment and treatment. Students in the Master's program must enroll in a minimum of 3 credit hours of CDIS 578V or CDIS 558V during their last semester of graduate studies. Prerequisite: Graduate standing; Completion of one semester of either CDIS 548V or CDIS 568V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 5813. Advanced Auditory (Re)Habilitation. 3 Hours.

This course provides students with an in-depth knowledge of hearing anatomy and physiology as well as current hearing and hearing assistive technologies. The development of auditory skills across the lifespan will be discussed as well as intervention techniques to facilitate auditory, speech, and spoken language skills across the lifespan. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5823. Language Learning with Multiple Disabilities. 3 Hours.

Approaches to services (assessment and intervention) for individuals who, as a result of multiple disabilities, are in the beginning stages of language development including the preintentional and presymbolic stages. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 5843. Communication and Swallowing in Dementia. 3 Hours.

This course provides an in-depth examination of the communication and feeding/swallowing factors demonstrated by patients with dementia. Etiologies, symptoms, progression, evaluation, and appropriate interventions for of the most common forms of dementia are addressed. Prerequisite: Graduate standing. (Typically offered: Summer)

CDIS 5883. Policies & Procedures in Educational Speech-Language Pathology. 3 Hours.

Educational Speech Pathology is designed to familiarize the student the factors related to functioning as an SLP in an educational setting, including state and federal regulations/standards, service delivery considerations, eligibility criteria, and documentation. Prerequisite: Graduate Standing. (Typically offered: Summer)

CDIS 590V. Special Problems. 1-6 Hour.

Special problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CDIS 599V. Seminar in Professional Issues. 1-3 Hour.

Selected topics in professional issues in speech-language pathology and audiology. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

CDIS 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CDIS 6103. Literacy for Learning in Educational Settings. 3 Hours.

An examination of language-based literacy skills, including consideration of development, disorders, assessment, and intervention. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 6203. Advanced Assessment and Intervention for Fluency Disorders. 3 Hours.

An examination of fluency disorders including theory, etiological factors, and development. In addition, the course is designed to address assessment and management of fluency disorders consistent with evidence-based practice for prospective speech-language pathologists. Prerequisite: Graduate standing. (Typically offered: Fall)

CDIS 6303. Effective Augmentative and Alternative Communication Services in Schools. 3 Hours.

This course will support current speech-language pathologists in becoming more effective speech-language pathologists as it relates to the provision of augmentative and alternative services in schools. Throughout this course, students will (a) identify a barrier they wish to address relevant to their current service provision or their current caseload, (b) discover strategies for addressing that barrier, and (c) develop a plan for improving their augmentative and alternative service provision through the implementation of those strategies in their own professional work. Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 6403. Advanced Pediatric Feeding and Swallowing Assessment & Intervention. 3 Hours.

Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children. Prerequisite: Graduate standing. (Typically offered: Irregular)

CDIS 6503. Behavioral Management in Educational Settings. 3 Hours.

The course provides an introduction to behavioral management across a variety of settings highlighting best practices from organizing time, materials, and room space. Strategies for managing individual and large group student behaviors, transitions, and other arrangements will be presented in addition to basic federal and state laws as they pertain to the legal procedures for all professionals, including educators of students with disabilities and students who use English as a Second Language (ESL). Prerequisite: Graduate standing. (Typically offered: Spring)

CDIS 699V. Seminar in Communication Sciences and Disorders. 1-6 Hour.

Discussion of pertinent topics and issues in the discipline of communication sciences and disorders. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

Computer Science and Computer Engineering (CSCE) Courses

CSCE 5013. Advanced Special Topics in Computer Science or Computer Engineering. 3 Hours.

Consideration of current computer engineering or computer science topics not covered in other courses. Prerequisite: Graduate standing in Computer Science Computer Engineering. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

CSCE 5033. Advanced Algorithms. 3 Hours.

Design of computer algorithms, with primary emphasis on the development of efficient implementation. Prerequisite: Graduate standing in Computer Science Computer Engineering. (Typically offered: Irregular)

CSCE 5043. Advanced Artificial Intelligence. 3 Hours.

In-depth introduction to AI. Topics include: philosophical foundations, cognition, intelligent agents, AI languages, search, genetic algorithms, first order and modal logic, inference, resolution, knowledge representation, ontologies, problem solving, planning, expert systems, uncertainty, probabilistic reasoning, fuzzy logic, machine learning, natural language processing, machine vision, and robotics. Prerequisite: CSCE 4613 or Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5053. Advanced Virtual Worlds. 3 Hours.

In depth study of 3D multi-user virtual worlds covering application domains like retail and healthcare logistics, simulations, training, and gaming as well as platform architectures. Students will apply their knowledge of programming and data structures while using synthetic worlds to explore, model and script future smart worlds where computing is pervasive. Prerequisite: Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5063. Machine Learning. 3 Hours.

An introduction to machine learning, with particular emphasis on neural network techniques. This course presents the basic principles underlying algorithms that improve with experience, and covers using them effectively for modeling data and making predictions. Prerequisite: Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5073. Data Mining. 3 Hours.

This course surveys the most common methods used in data mining and machine learning. It involves several projects in which students will implement tools that are useful for mining knowledge from data and making predictions. The course will study both heuristic algorithms and statistical techniques. Prerequisite: CSCE 3193 and (INEG 2313 or STAT 3013) or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5114. Embedded Systems. 4 Hours.

(Formerly CSCE 4114.) The architecture, software, and hardware of embedded systems. Involves a mixture of hardware and software for the control of a system (including electrical, electro-mechanical, and electro-chemical systems). They are found in a variety of products including cars, VCRs, HDTVs, cell phones, pacemakers, spacecraft, missile systems, and robots for factory automation. Graduate degree credit will not be given for both CSCE 4114 and CSCE 5114. Corequisite: Lab component. Prerequisite: CSCE 2214 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Fall)

CSCE 5133. Algorithms. 3 Hours.

(Formerly CSCE 4133.) Provides an introduction to formal techniques for analyzing the complexity of algorithms. The course surveys important classes of algorithms used in computer science and engineering. Graduate degree credit will not be given for both CSCE 4133 and CSCE 5133. Prerequisite: ((CSCE 3193 and (MATH 2603 or MATH 2803)) or (MATH 4423) or (Computer Science/Computer Engineering(CS/CE) graduate standing). (Typically offered: Fall)

CSCE 5173. Formal Languages and Computability. 3 Hours.

(Formerly CSCE 4323.) Finite Automata and regular languages, regular expressions, context-free languages and pushdown automata, nondeterminism, grammars, and Turing machines. Church's thesis, halting problem, and undecidability. Graduate degree credit will not be given for both CSCE 4323 and CSCE 5173. Prerequisite: CSCE 4133 or CSCE 5133 (formerly CSCE 4133). (Typically offered: Spring)

CSCE 5183. Advanced Data Structures. 3 Hours.

(Formerly CSCE 4263.) This course continues the study of data structures, algorithmic analysis for these data structures, and their efficient implementation to support standard library in programming languages. Topics include: AVL trees, Red-Black trees, Splay trees, Optimal Binary Search trees, 2-3 tree, 2-3-4 tree, B-trees, Segment trees, Leftist Heaps, Binomial Heaps, Fibonacci Heap, Disjoint Set, Hashing, and big integer with hundreds to thousands of digits. Graduate degree credit will not be given for both CSCE 4263 and CSCE 5183. Prerequisite: CSCE 3193 or Computer Science Computer Engineering(CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5193. Concurrent Computing. 3 Hours.

(Formerly CSCE 4253.) Programming concurrent processes; computer interconnection network topologies; loosely coupled and tightly coupled paralleled computer architectures; designing algorithms for concurrency; distributed computer architectures. Graduate degree credit will not be given for both CSCE 4253 and CSCE 5193. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5203. Advanced Database Systems. 3 Hours.

Topics include: object databases, distributed databases, XML query, data warehouses, network as database systems, peer-peer data sharing architectures, data grids, data mining, logic foundations, semantic databases, spatial and temporal databases, and knowledge bases. Prerequisite: CSCE 4523 or CSCE 5523. (Typically offered: Irregular)

CSCE 5213. Bioinformatics. 3 Hours.

Application of algorithmic techniques to the analysis and solution of biological problems. Topics include an introduction to molecular biology and recombinant DNA technology, biological sequence comparison, and phylogenetics, as well as topics of current interest. Prerequisite: Instructor consent or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5223. Introduction to Integrated Circuit Design. 3 Hours.

Design and layout of large scale digital integrated circuits using CMOS technology. Topics include MOS devices and basic circuits, integrated circuit layout and fabrication, dynamic logic, circuit design, and layout strategies for large scale CMOS circuits. Students may not receive credit for both CSCE 4333 and CSCE 5223. Prerequisite: ELEG 3214 or ELEG 3933 and MATH 2584. (Typically offered: Fall)

CSCE 5233. Low Power Digital Systems. 3 Hours.

(Formerly CSCE 4233.) The reduction of power consumption is rapidly becoming one of the key issues in digital system design. Traditionally, digital system design has mainly focused on performance and area trade-offs. This course will provide a thorough introduction to digital design for lower consumption at the circuit, logic, and architectural level. Graduate degree credit will not be given for both CSCE 4233 and CSCE 5233. Prerequisite: CSCE 2214 with a grade of C or better. (Typically offered: Irregular)

CSCE 5253L. Integrated Circuit Design Laboratory I. 3 Hours.

Design and layout of large scale digital integrated circuits. Students design, check and simulate digital integrated circuits which will be fabricated, and tested in I.C. Design Laboratory II. Topics include computer aided design, circuit timing, and wire delay. Prerequisite: CSCE 4333. (Typically offered: Irregular)
This course is cross-listed with ELEG 5253L.

CSCE 5263. Computational Complexity. 3 Hours.

Turing machines, recursion theory and computability, complexity measures, NP-completeness, analysis on NP-complete problems, pseudo-polynomial and approximation. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5273. Big Data Analytics and Management. 3 Hours.

Topics include principles of distributed data computing and management, design and implementation of non-relational data systems, crowd sourcing and human computation, big data analytics and scalable machine learning, real-time streaming data analysis, and social aware computing. Prerequisite: CSCE 3193 and INEG 2313 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5283. Graph and Combinatorial Algorithms. 3 Hours.

A study of algorithms for graphs and combinatorics with special attention to computer implementation and runtime efficiency. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5293. Computer Architecture. 3 Hours.

(Formerly CSCE 4213.) The architecture of modern scalar and parallel computing systems. Techniques for dynamic instruction scheduling, branch prediction, instruction level parallelism, shared and distributed memory multiprocessor systems, array processors, and memory hierarchies. Graduate degree credit will not be given for both CSCE 4213 and CSCE 5293. Prerequisite: CSCE 2214 with a grade of C or better. (Typically offered: Spring)

CSCE 5313. Advanced Operating Systems. 3 Hours.

Concurrent processes and process communication; mutual exclusion and synchronization principles; kernel philosophy; resource allocation and deadlock; and case studies of specific operating systems. Prerequisite: CSCE 3613 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5323. Computer Security. 3 Hours.

Study of a broad selection of contemporary issues in computer security. Topics include access control, security policies, authentication methods, secure system design, and information assurance. Prerequisite: CSCE 3613 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5333. Computer Forensics. 3 Hours.

Various methods for identification, preservation, and extraction of electronic evidence at a computer crime scene. Specific topics include auditing and investigation of network and host intrusions, computer forensics tools, resources for system administrators and information security officers, legal issues related to computer and network forensics. Prerequisite: CSCE 5323. (Typically offered: Irregular)

CSCE 5343. Advanced Software Engineering. 3 Hours.

This course is about software metrics and models. It will focus on quantitative methods and techniques for management of software projects, design of software systems, and improvement of software quality. The material covered will be metrics and models used in the software lifecycle, such as software requirements metrics, design metrics, implementation metrics, testing metrics, effort estimation model. Prerequisite: CSCE 3513 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5353. CPLD/FPGA-Based System Design. 3 Hours.

(Formerly CSCE 4353.) Field Programmable Logic devices (FPGAs/CPLDs) have become extremely popular as basic building blocks for digital systems. They offer a general architecture that users can customize by inducing permanent or reversible physical changes. This course will deal with the implementation of logic options using these devices. Graduate degree credit will not be given for both CSCE 4353 and CSCE 5353. Prerequisite: CSCE 2214 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5373. Electronic Design Automation. 3 Hours.

This course studies physical design, analysis and optimization of VLSI circuits and systems with emphasis on computational realizations and optimization. We start with some related topics such as graph algorithms and discuss various well-known algorithms and methodologies in the design process of VLSI circuits, including design partitioning, logic synthesis, floorplanning, routing, static timing analysis and performance-driven layout. It requires a basic knowledge of digital circuit design, data structure, and object-oriented programming. Students cannot receive credit for both CSCE 4373 and CSCE 5373. Prerequisite: Graduate standing in Computer Engineering, Computer Science, or Electrical Engineering. (Typically offered: Irregular)

CSCE 5423. Cryptography. 3 Hours.

(Formerly CSCE 4433.) This course provides a general introduction to modern cryptography. Topics include: stream ciphers, block ciphers, message authentication codes, public key encryption, key exchange, and signature schemes. Graduate degree credit will not be given for both CSCE 4433 and CSCE 5423. Prerequisite: CSCE 2014 with a grade of C or better and (MATH 2603 or MATH 2803) or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5433. Advanced Cryptography. 3 Hours.

This course provides an in-depth look into some facet of either cryptographic theory or the implementation of cryptography. Topics may include: the discrete logarithm problem, integer factorization, information theory, elliptic curves, lattices, pseudorandom number generators, zero-knowledge proofs, and quantum cryptography. Prerequisite: CSCE 4433 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5523. Database Management Systems. 3 Hours.

(Formerly CSCE 4523.) Introduction to database management systems, architecture, storage structures, indexing, relational data model, E-R diagrams, query languages, SQL, ODBC, transaction management, integrity, and security. Graduate degree credit will not be given for both CSCE 4523 and CSCE 5523. Prerequisite: CSCE 3193 with a C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Spring)

CSCE 5533. Advanced Information Retrieval. 3 Hours.

Study of the architecture, implementation, and evaluation of current information retrieval systems. Students will apply their knowledge of programming and data structures to implement a large system with an emphasis on efficiency and scalability. They will study current research in the field and implement individual or group projects on advanced topics. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5543. Statistical Natural Language Processing. 3 Hours.

Introduction to statistical natural language processing (NLP). Covers the theory and algorithms needed for building NLP tools, provides broad coverage of mathematical and linguistic foundations, and detailed discussion of statistical methods for text mining and information extraction. Current research and applications of statistical NLP will be discussed. Prerequisite: CSCE 2014 and (STAT 3013 or INEG 2313) or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5553. Software Architecture. 3 Hours.

(Formerly CSCE 4543.) A study of software architecture through the use of case studies drawn from real systems designed to solve real problems from technical as well as managerial perspectives. Techniques for designing, building, and evaluating software architectures. Graduate degree credit will not be given for both CSCE 4543 and CSCE 5553. Prerequisite: CSCE 4133 or CSCE 5133 (formerly CSCE 4133) and CSCE 3513. (Typically offered: Irregular)

CSCE 5613. Artificial Intelligence. 3 Hours.

(Formerly CSCE 4613.) Introduction to intelligent agents, AI languages, search, first order logic, knowledge representation, ontologies, problem solving, natural language processing, machine vision, machine learning, and robotics. Graduate degree credit will not be given for both CSCE 4613 and CSCE 5613. Prerequisite: CSCE 2014 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5623. Secure Digital System Design. 3 Hours.

This course is to give graduate students an insight of contemporary security-related issues in modern digital systems. In addition to lectures, students will be practicing secure digital system design during a project. (Typically offered: Irregular)

CSCE 5643. Computer Communications Networks. 3 Hours.

A study of computer communication networks, including the data link layer, routing, flow-control, local area networks, TCP/IP, ATM, B-ISDN, queuing analysis, and recent developments in computer communications. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5653. Network Security. 3 Hours.

This course introduces security and secrecy in a networked environment. It is intended to familiarize students with the elements of secure communication, and how they inter-relate to provide secure networks in public and private settings. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5663. Database Security. 3 Hours.

This is an advanced course covering security issues in database systems. Topics to be covered include discretionary and mandatory access control policies, multilevel secure database systems, auditing, data recovery, database intrusion detection, database insider threat, etc. Prerequisite: CSCE 4523 or CSCE 5523. (Typically offered: Irregular)

CSCE 5673. Mobile Programming. 3 Hours.

(Formerly CSCE 4623.) An introduction to software development on mobile devices. The major topics covered in this course include underlying concepts and principles in mobile programming, as well as hands-on programming experience on mobile devices with an emphasis on smartphones. Graduate degree credit will not be given for both CSCE 4623 and CSCE 5673. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5683. Image Processing. 3 Hours.

The objective of this class is to give students a hands-on introduction to the fundamentals of image processing. A variety of image processing techniques and applications will be discussed including image enhancement, noise removal, spatial domain and frequency domain filtering, image restoration, color image processing, image compression, edge detection and image segmentation. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5693. Graphics Processing Units Programming. 3 Hours.

(Formerly CSCE 4643.) This course provides an introduction to massively parallel programming using Graphics Processing Units (GPUs). Topics include basic programming model, GPU thread hierarchy, GPU memory architecture, and performance optimization techniques and parallel patterns needed to develop real-life applications. Graduate degree credit will not be given for both CSCE 4643 and CSCE 5693. Prerequisite: CSCE 2014 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5703. Computer Vision. 3 Hours.

The objective of this course is to give students a hands-on introduction to the fundamentals of computer vision. Topics include image formation, object modeling, image processing, feature and edge detection, image segmentation, motion estimation, depth from stereo, shape description and object recognition. Prerequisite: CSCE 3193 and CSCE 4613 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5753. Wireless Systems Security. 3 Hours.

Wireless systems such as wireless local area networks, cellular and mobile networks, and sensor networks are vulnerable to attacks. The goal of the class is for students to understand how to design secure wireless systems. Security topics include confidentiality, integrity, availability, privacy, and control of fraudulent usage of networks. Issues addressed include basic wireless theory, cryptography, threat modeling, risks, and mitigation techniques. Prerequisite: Graduate standing in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5763. Privacy Enhancing Technologies. 3 Hours.

This course introduces privacy enhancing technologies and hot privacy topics in modern computing systems. Students will be exposed to many interesting privacy problems, study privacy enhancing technologies, and apply their knowledge to explore an open research problem in a research-oriented project. After completing this course, students will gain broad knowledge of the state-of-the-art privacy enhancing technologies and open research problems. They will also develop skills and enhance potentials to do research on privacy and security. Prerequisite: Must be a graduate student in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5773. Computer Networks. 3 Hours.

(Formerly CSCE 4753.) This course is an introductory course on computer networks. Using the Internet as a vehicle, this course introduces underlying concepts and principles of modern computer networks, with emphasis on protocols, architectures, and implementation issues. Graduate degree credit will not be given for both CSCE 4753 and CSCE 5773. Prerequisite: INEG 2313 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5783. Cloud Computing and Security. 3 Hours.

Cloud computing has entered the mainstream of information technology, providing highly elastic scalability in delivery of enterprise applications and services. In this course, we will focus on the architecture of today's cloud computing, the technologies used within them, application development using contemporary cloud computing tools, and the security risks and management in the cloud. Graduate degree credit will not be given for both CSCE 4783 and CSCE 5783. Prerequisite: CSCE 3613 or graduate standing in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5813. Computer Graphics. 3 Hours.

(Formerly CSCE 4813.) Introduction to the theory and algorithms used in computer graphics systems and applications. Topics include: 2D and 3D geometric models (points, lines, polygons, surfaces), affine transformations (rotation, translation, scaling), viewpoint calculation (clipping, projection), lighting models (light-material interactions, illumination and shadow calculation). Students will implement their own graphics pipeline to demonstrate many of these techniques. Higher level computer graphics applications will be created using OpenGL. Graduate degree credit will not be given for both CSCE 4813 and CSCE 5813. Prerequisite: CSCE 2014 with a grade of C or better or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5823. Multiprocessor Systems on Chip. 3 Hours.

This course covers the latest trends in advanced computer architecture for multiprocessor systems on chip for embedded and real time systems. Topics covered include multicore architectures, modeling abstractions, run time systems, and MIMD/SIMD heterogeneous architectures, Hw/Sw co-design techniques. Prerequisite: CSCE 3613 and CSCE 4213. (Typically offered: Irregular)

CSCE 5833. Computer Architecture Security. 3 Hours.

This course will cover fundamental principles and emerging implementation strategies to reason about, design and construct architecture level security capabilities in the manycore era. Coverage includes formal security models, new and emerging considerations for heterogeneous multiprocessor system on chip architectures, hardware and software implementation methods, operating systems for run time security enforcement. Prerequisite: CSCE 4213 or graduate standing in Computer Science Computer Engineering (CSCE). (Typically offered: Irregular)

CSCE 5843. Reconfigurable Computing. 3 Hours.

This course will cover emerging and proposed techniques and issues in Reconfigurable Computing. Topics will include FPGA technologies, CAD/CAE tools, Hw/Sw co-design, system level synthesis, programming models and abstractions. Prerequisite: CSCE 4213 and CSCE 3613. (Typically offered: Irregular)

CSCE 5853. Information Security. 3 Hours.

(Formerly CSCE 4853.) This course covers principles, mechanisms, and policies governing confidentiality, integrity, and availability of digital information. Topics to be covered include security concepts and mechanisms, security policies, multilevel security models, system vulnerability, threat and risk assessment, basic cryptography and its applications, intrusion detection systems. Graduate degree credit will not be given for both CSCE 4853 and CSCE 5853. Prerequisite: CSCE 3193 or Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 590V. Advanced Individual Study. 1-3 Hour.

Advanced graduate level individual study directed by faculty in current research topics, state of the art, or advanced methodology in one of the major computer science or computer engineering areas. (Typically offered: Irregular)

CSCE 5914. Advanced Digital Design. 4 Hours.

To master advanced logic design concepts, including the design and testing of synchronous and asynchronous combinational and sequential circuits using state of the art CAD tools. Graduate degree credit will not be given for both CSCE 5914 and CSCE 4914 or ELEG 4914 and ELEG 5914. Corequisite: Lab component. Prerequisite: Graduate students majoring in Computer Engineering, Computer Science, or Electrical Engineering. (Typically offered: Irregular)
This course is cross-listed with ELEG 5914.

CSCE 5943. Computer Arithmetic Circuits. 3 Hours.

Examination of fundamental principles of algorithms for performing arithmetic operations in computers. This course provides sufficient theoretical and practical information to prepare the digital design engineer with an awareness of basic techniques for the realization of arithmetic circuits. Prerequisite: Computer Science Computer Engineering (CSCE) graduate standing. (Typically offered: Irregular)

CSCE 5983. Application Specific Integrated Circuit Design. 3 Hours.

ASIC design is taught with emphasis on industrial preparation. Topics include ASIC technologies, design entry, simulation, and synthesis. Advanced design methods and techniques are studied for cell based and gate array ASICs. Prerequisite: CSCE 4213. (Typically offered: Irregular)

CSCE 610V. Master's Thesis. 1-6 Hour.

Master's thesis. (Typically offered: Fall and Spring) May be repeated for degree credit.

CSCE 620V. Post-Master's Research. 1-18 Hour.

Post-master's research. (Typically offered: Fall and Spring)

CSCE 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Counselor Education (CNED) Courses

CNED 5003. Counseling and Human Development. 3 Hours.

This course is intended to give students a broad overview of human nature/behavior through knowledge of lifespan developmental theory, personality development, modern & post-modern approaches to the study of human nature/behavior, and learning theory. Throughout the course, close attention will be given to human ecology or those social/historical/cultural/environmental forces furthering or impeding development. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

CNED 5193. Clinical Mental Health Counseling. 3 Hours.

An introductory study of community counseling. The course content includes information concerning the educational, historical, philosophical, and psychological foundations of community counseling as well as specific traits and skills of professional community counselors. In addition, the course is designed to provide introductory level concepts and skills required for future certification and licensure as counseling professionals. Prerequisite: Graduate student status. (Typically offered: Spring)

CNED 5203. Foundations of the Counseling Profession. 3 Hours.

A study of the counseling profession applicable to school, college and community agency settings. Introduction to the basic educational, historical, philosophical foundations of counseling as well as specific traits and skills of counselors. The course is also designed to provide beginning level concepts and skills required for certification and licensure. Prerequisite: Must be taken first year in program. (Typically offered: Fall and Summer)

CNED 5213. Lifestyle & Career Development. 3 Hours.

Theories of career development and counseling, including the use of occupational information sources and career assessment tools and techniques. Prerequisite: CNED 5333. (Typically offered: Summer)

CNED 5223. Introduction to School Counseling. 3 Hours.

Philosophy, organization, and practices of a counseling program in the elementary and secondary school. The school counselor's role as counselor, consultant, and coordinator, professional identity, and legal issues are included. Includes a significant focus on ethical standards and issues. (Typically offered: Irregular)

CNED 5303. Individual Appraisal. 3 Hours.

Analysis of concepts, methods, and procedures utilized in individual appraisal. (Typically offered: Fall)

CNED 5313. Program Organization and Information Management. 3 Hours.

This course addresses needs and strategies for effective development and management of school counseling programs and guidance curriculum. Prerequisite: CNED 5223. (Typically offered: Fall)

CNED 5323. Counseling Theory. 3 Hours.

Introductory survey and critical analysis of major alternative theoretical perspectives in counseling. (Typically offered: Fall and Summer)

CNED 5333. Basic Counseling Techniques. 3 Hours.

Introduction to basic counseling techniques and skills common to multiple theoretical perspectives. Prerequisite: Master's students in Counseling. (Typically offered: Fall and Spring)

CNED 5343. Counseling Practicum. 3 Hours.

Supervised counseling practice. CNED faculty consent required. Pre- or Corequisite: CNED 5303 and CNED 5363 and CNED 5373. Prerequisite: CNED 5203, CNED 5323, CNED 5333, CNED 5403. (Typically offered: Fall and Spring)

CNED 5353. Psychopharmacology. 3 Hours.

Study of theory, research, & practice issues pertaining to psychopharmacology for non-medical practitioners. Prerequisite: CNED 5203, CNED 5323, and CNED 5333. (Typically offered: Summer)

CNED 5363. Dynamics of Group Counseling. 3 Hours.

Therapeutic and other theoretical information is presented regarding group process and the counselor's role in that process. An experiential group experience is required. Prerequisite: CNED 5333 and CNED 5323. (Typically offered: Fall and Spring)

CNED 5373. Ethical and Legal Issues in Counseling. 3 Hours.

Review of ethical and legal standards governing professional counselor training, research, and counseling practice; including client rights; confidentiality; the client-counselor relationship; and counseling research, training, and supervision. Prerequisite: CNED 5003 and CNED 5203. (Typically offered: Fall)

CNED 5383. Crisis Intervention Counseling. 3 Hours.

Analysis and application of short-term counseling intervention strategies in crisis situations, with special attention to incidents involving rape, physical, or emotional abuse, divorce, suicidal depression, grief, marital or family instability, and violent conflict. Prerequisite: CNED 5333. (Typically offered: Summer)

CNED 5403. Diagnosis and Treatment in Counseling. 3 Hours.

Procedures in case management utilizing both clinical and interview data in assisting children, adolescents, and adults in educational, vocational, personal, and social planning. Prerequisite: CNED 5303, CNED 5323 and CNED 5333. (Typically offered: Fall and Spring)

CNED 5443. Vocational Rehabilitation Foundations. 3 Hours.

Survey of the philosophy of vocational rehabilitation, including history and legislation. (Typically offered: Fall)

CNED 5453. Medical Aspects of Disability. 3 Hours.

Orientation to medical and medically related aspects of various disabling conditions with emphasis on the severely disabled. (Typically offered: Spring)

CNED 5463. Rehabilitation Case Management. 3 Hours.

Counseling process in the rehabilitation setting. Focusing upon effective counseling strategies, representative cases, and effective case management methods. (Typically offered: Spring)

CNED 5473. Psychological Aspects of Disability. 3 Hours.

Intensive study of the psychological aspects of adjustment to atypical physique and prolonged handicapping condition. (Typically offered: Spring)

CNED 5483. Counseling Research. 3 Hours.

An in-depth examination of counseling research methodology and issues to prepare students to critically evaluate and use counseling research in their professional practice. (Typically offered: Fall, Spring and Summer)

CNED 5493. Principles and Practices of Psychiatric Rehabilitation. 3 Hours.

The course introduces students to the principles and practices of recovery-oriented, evidence-based psychiatric rehabilitation. Through lectures, guest presentations, films, discussions, and readings, students (a) explore the clinical, psychosocial, and vocational aspects of psychiatric disabilities and (b) examine psychiatric rehabilitation principles and practices to facilitate community integration and successful employment outcomes for individuals with psychiatric disabilities. (Typically offered: Fall)

CNED 5513. Counseling and Human Diversity. 3 Hours.

Examination of human and cultural diversity, emphasizing issues of race, class, and socioeconomic status, and how they impact our clients as individuals and as family and society members. (Typically offered: Summer)

CNED 5523. Process and Behavioral Addictions. 3 Hours.

This course provides an overview of non-substance related addictive disorders such as technology (e.g., video games, Internet, television), gambling, eating, sex, shopping/buying and work as well as potential treatment options for these disorders. (Typically offered: Irregular)

CNED 5533. Introduction to Adventure Therapy. 3 Hours.

This course builds on the foundational understanding of group counseling theory and skills by introducing students to Adventure Therapy (AT), an activity-oriented form of group counseling. Students will integrate previous knowledge pertaining to group counseling with new AT concepts as well as review issues related to current research, best practices, and working with diverse populations. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CNED 5583. Placement of Persons with Disabilities. 3 Hours.

Focuses on placement theory and practice as they apply to persons who experience disabilities. Special attention is given to RehabMark approach. (Typically offered: Summer)

CNED 574V. Counseling Internship. 1-9 Hour.

A 600-clock-hour field placement in an approved setting over a minimum of two continuous semesters. For students completing a counseling internship in a school setting, successful completion of a criminal background check is required before beginning internship. Pre- or Corequisite: CNED 5213. Prerequisite: CNED 5203, CNED 5303, CNED 5323, CNED 5333, CNED 5343, CNED 5363, CNED 5373, CNED 5403, CNED 5513. CNED faculty consent required. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

CNED 599V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CNED 6003. Theories and Foundations of Addictions. 3 Hours.

A study of behavioral and substance addictions, including an overview of differential treatment. Prerequisite: CNED 5323 and CNED 5333, and admission to the CNED masters or doctoral program or departmental consent. (Typically offered: Spring and Summer)

CNED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CNED 6013. Advanced Counseling Theory and Methods. 3 Hours.

Critical analysis of major theoretical perspectives in counseling, including both group and individual counseling strategies for dealing with affective, cognitive, and behavioral dysfunction. Prerequisite: CNED doctoral standing or permission. (Typically offered: Spring Even Years)

CNED 6023. Foundations of Marriage and Family Counseling Therapy. 3 Hours.

Comprehensive exploration of the current theories/techniques of marriage, family and couples counseling. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or permission. (Typically offered: Summer)

CNED 6033. Advanced Group Theory and Methods. 3 Hours.

Comparative study of theories and processes of group counseling. Includes supervised experience in group facilitation with video recording and playback. Prerequisite: CNED 5363 or equivalent and CNED doctoral or masters standing or permission. (Typically offered: Spring Odd Years)

CNED 6043. Supervision of Counselors. 3 Hours.

Analysis, assessment, and practical application of counselor supervision techniques in treatment and training programs. Prerequisite: CNED doctoral standing and CNED faculty consent (Typically offered: Fall Even Years)

CNED 605V. Independent Study. 1-18 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CNED 6073. Advanced Research in Counseling. 3 Hours.

This course involves acquiring a knowledge and understanding of the use of research in counseling and the development of new research in the counseling profession that has heuristic value. Prerequisite: Graduate standing. (Typically offered: Spring)

CNED 6083. Consultation Theory and Methods. 3 Hours.

Strategies, practical application, and techniques for effective consultation with parents, teachers, and community agencies. Prerequisite: CNED 5333 (preferred) CNED doctoral or masters standing or permission. (Typically offered: Summer)

CNED 6093. Counseling Children and Adolescents Through Play. 3 Hours.

Introduction to counseling children and adolescents through play; including the process, theories, techniques, and materials applicable to children and adolescents in a pluralistic society. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or permission. (Typically offered: Spring)

CNED 6133. Introduction to Play Therapy. 3 Hours.

This course is an introduction to the basic concepts of child-centered play therapy (CCPT). Students will learn the conceptual framework of child-centered play therapy, as well as the attitudes and skills necessary to establish and maintain facilitative relationships with children that encourage their self-expression and facilitate change. Prerequisite: CNED 5323 and CNED 5333 and CNED doctoral or masters standing or consent. (Typically offered: Irregular)

CNED 6223. Foundations of Counselor Education and Supervision. 3 Hours.

This course is designed to enhance the professional development and acculturation of doctoral students in order to facilitate their success in professional leadership roles of counselor education, supervision, counseling practice, and research competencies. Prerequisite: CNED Doctoral status or permission. (Typically offered: Spring Odd Years)

CNED 6233. Employment Practices and Interventions. 3 Hours.

An intensive study of the employment experiences of workers with disabilities with emphasis on disincentives and barriers to employment and interventions to enable people with disabilities to participate in employment. Prerequisite: RHAB 5493 or equivalent. (Typically offered: Irregular)

CNED 6243. Disability Policy in the U.S.. 3 Hours.

An analysis of public policy approaches to disability in the U.S. Examines the political and philosophical origins of disability policy; reviews major disability legislation and its effects on policy stakeholders; describes recent initiatives; and analyzes evolution of disability policy within context of changing societal, economic, and political conditions. (Typically offered: Fall)

CNED 6253. Advanced Psychosocial Aspects of Disability. 3 Hours.

A theoretical and applied study of techniques that enable people to cope with 2 major life events: disability and unemployment. (Typically offered: Fall Odd Years)

CNED 6343. Cultural Foundations and Counseling. 3 Hours.

To gain learning experiences in pedagogy relevant to multicultural issues and competencies, including social change theory and advocacy action planning. To identify current multicultural issues as they relate to social change theories, ethical and legal considerations, disability, gender, sexuality, social justice, and advocacy models. Prerequisite: CNED or RHAB Doctoral Standing or Permission. (Typically offered: Fall Even Years)

CNED 6713. Advanced Counseling Practicum. 3 Hours.

Supervised counseling practice. A 100-clock hour approved practical counseling experience. Prerequisite: CNED doctoral standing and permission of CNED faculty and Clinical Coordinator. (Typically offered: Spring) May be repeated for up to 3 hours of degree credit.

CNED 674V. Internship. 1-18 Hour.

Supervised field placement (Clinical/Instructorship/Supervision/Research). Prerequisite: CNED doctoral standing, CNED faculty consent and CNED Clinical Coordinator consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CNED 699V. Seminar. 1-18 Hour.

Seminar. Prerequisite: CNED Doctoral standing or permission. (Typically offered: Summer) May be repeated for up to 18 hours of degree credit.

CNED 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy and consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Crop, Soil and Environmental Sciences (CSES)

Courses

CSES 5001. Weed Science Practicum. 1 Hour.

Training for membership on weed team, through participation. Prerequisite: Graduate standing. (Typically offered: Summer)

CSES 5013. Crop Physiology. 3 Hours.

Understanding and quantitative measurement of physiological processes, plant responses, and environmental parameters in relation to the production of crops. Prerequisite: BIOL 4303. (Typically offered: Spring Even Years)

CSES 5023. Physiology of Herbicide and Plant Interaction. 3 Hours.

The reproduction, growth, and development of weeds and the ecological factors affecting these processes; development and mechanisms of herbicide resistance, flow of herbicide-resistance genes; and development of herbicide-resistant crops. Corequisite: Lab component. Prerequisite: CSES 4143 or CSES 5143 (formerly CSES 4143) and (BIOL 4303 or CHEM 5813). (Typically offered: Spring Odd Years)

CSES 502V. Special Problems Research. 1-6 Hour.

Original investigations on assigned problems in agronomy. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

CSES 5033. Advanced Soil Fertility and Plant Nutrition. 3 Hours.

Study of water uptake, ion absorption, translocation and metabolism in higher plants. Lecture 3 hours per week. Prerequisite: BIOL 4303 and CHEM 2613 and CHEM 2611L. (Typically offered: Spring Even Years)

CSES 504V. Special Topics. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in agronomy. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

CSES 5073. Advanced Crop Science. 3 Hours.

Fundamental concepts of crop physiology, crop improvement, seed science, and crop production systems. Recitation 3 hours per week. Graduate degree credit will not be given for both CSES 4013 and CSES 5073. (Typically offered: Fall)

CSES 5093. Plant Breeding. 3 Hours.

(Formerly CSES 4103.) Basic principles involved in plant breeding programs to improve crop plants and seed programs. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4103 and CSES 5093. Corequisite: Lab component. Prerequisite: ANSC 3123 or BIOL 2323. (Typically offered: Fall Even Years)

CSES 5103. Scientific Presentations. 3 Hours.

Experience in procedures required for professional presentations of scientific papers, seminars, posters; and research findings at meetings in conferences, and with discussion groups. Instruction in organization of materials, visual aids, and good speaking habits. Lecture 3 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall)

CSES 5114. Soil Fertility. 4 Hours.

Study of the soil's chemical, biological and physical properties, and human modification of these properties, as they influence the uptake and utilization of the essential nutrients by plants. Lecture 3 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4224 and CSES 5114. Corequisite: Lab component. (Typically offered: Fall)

CSES 5133. Ecology and Morphology of Weedy and Invasive Plants. 3 Hours. (Formerly CSES 4133.) Study of weeds as economic pests occurring in both agricultural and nonagricultural situations and including poisonous plants and other specific weed problems. Gross morphological plant family characteristics which aid identification, habitat of growth and distribution, ecology, competition, and allelopathy are discussed. Lecture 2 hours, laboratory 2 hours a week. Graduate degree credit will not be given for both CSES 4133 and CSES 5133. Corequisite: Lab component. Prerequisite: CSES 2103 or HORT 2003. (Typically offered: Fall)

CSES 5143. Principles of Weed Control. 3 Hours. (Formerly CSES 4143.) Advanced concepts and technology used in modern weed control practices and study of the chemistry and specific activity of herbicides in current usage. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4143 and CSES 5143. Corequisite: Lab component. Prerequisite: CHEM 1073 and CHEM 1071L. (Typically offered: Spring)

CSES 5214. Analytical Research Techniques in Agronomy. 4 Hours. Preparation and analysis of plant and soil samples utilizing spectrophotometry, isotopes, and chromatographic separation methods. Additionally, measurements are made of photosyntheses, respiration, water relationships, light, and temperatures in whole plants. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Lab component. Prerequisite: BIOL 4303 and CHEM 2613 and CHEM 2611L. (Typically offered: Fall Even Years)

CSES 5224. Soil Physics. 4 Hours. Physical properties of soils and their relation to other soil properties, growth of plants and transport of water, oxygen, heat, and solutes such as pesticides and plant nutrients. Lecture 3 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CSES 2203 and MATH 1203. (Typically offered: Spring)

CSES 5233. Plant Genetic Engineering. 3 Hours. Topics will be covered in the field of in vitro plant biology, transgene genetics and crop genetic engineering. Concepts and applications of transgenic plant technology will be discussed, with the emphasis on the strategies for crop improvement and gene discovery. Lecture 3 hours. (Typically offered: Spring Odd Years)

CSES 5253. Soil Classification and Genesis. 3 Hours. (Formerly CSES 4253.) Lecture and field evaluation of soil properties and their relation to soil genesis and soil classification with emphasis on soils of Arkansas. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both CSES 4253 and CSES 5253. Corequisite: Lab component. Prerequisite: CSES 2203 and CSES 2201L. (Typically offered: Fall Odd Years)

CSES 5264. Microbial Ecology. 4 Hours. A study of the microorganisms in soil and the biochemical processes for which they are responsible. Lecture 3 hours, laboratory 3 hours per week. Additional suggested prerequisites are BIOL 2013, CSES 2203, and ENSC 3003. Corequisite: Lab component. Prerequisite: BIOL 1543 and BIOL 3863 or ENSC 3223. (Typically offered: Fall Odd Years)

CSES 5303. Bioenergy Feedstock Production. 3 Hours. (Formerly CSES 4303.) Overview of production and characteristics of cultivated crops, perennial grasses, and woody species as feedstocks for bioenergy. Fundamentals of plant growth factors, culture, harvest and storage, quality and improvement, and introduction to environmental impact, modeling, and resource utilization. Graduate degree credit will not be given for both CSES 4303 and CSES 5303. Prerequisite: MATH 1203 and BIOL 1543 or CSES 1203. (Typically offered: Spring)

CSES 5323. Soil/Water Quality in Bioenergy Feedstock Production Systems. 3 Hours.

Examine concepts of soil and water quality in relation to bioenergy feedstock production, explore research related to biomass removal and by-product addition to soils, and examine the potential effects of proposed feedstock production systems on soil and water quality. Prerequisite: MATH 1203 and CSES 2203 or equivalent or consent of instructor, and CSES 4303 or CSES 5303 (formerly CSES 4303) preferred. (Typically offered: Fall Odd Years)

CSES 5453. Soil Chemistry. 3 Hours. Application of the principles of chemistry to processes of agronomic and environmental importance in soils. Soil clay mineralogy, soil solution thermodynamics, structure and reactivity of humus, surface complexation and ion exchange, electro-chemical phenomena, and colloidal stability. Prerequisite: CSES 2203 and CHEM 1123 and CHEM 1121L. (Typically offered: Fall Even Years)

CSES 5533. Wetland Soils. 3 Hours. (Formerly CSES 4553.) This course explains the chemical, physical, and morphological characteristics of wetland soils and describes the techniques for identifying wetland soils using field indicators and monitoring equipment. This course also explains principles of wetland creation, restoration, and mitigation - all key components in assuring the sustainability of valuable wetland resources. Graduate degree credit will not be given for both CSES 4553 and CSES 5533. Prerequisite: CSES 2203 and CSES 2201L or CSES 355V. (Typically offered: Spring Odd Years)

CSES 5543. Plant Genomics. 3 Hours. Plant genetics based on the study of whole genome sequence, transcriptome and proteome. Provides an overview of the principles and techniques of experimental and in silico genomics. Covers all areas of genome research including structural, comparative and functional genomics as well as proteomics. Prerequisite: CHEM 5843 or any graduate level genetics course. (Typically offered: Spring Even Years)

CSES 5553. Forage-Ruminant Relations. 3 Hours. Advanced chemical, physical, and botanical characteristics of forage plants, the dynamics of grazing, intake and digestion, and techniques of measuring forage utilization and systems analysis at the plant-animal interface. CSES 1203 recommended. Corequisite: Lab component. Prerequisite: ANSC 3143. (Typically offered: Spring Odd Years)
This course is cross-listed with ANSC 5553.

CSES 5653. Fate and Transport of Organic Contaminants. 3 Hours. Fate and Transport of Organic Contaminants will present an overview of the transformation and transport processes that influence the environmental fate of organic contaminants, with an emphasis on agricultural pesticides. Biotic and abiotic factors influencing the movement and behavior of organic contaminants in soil and water will be covered extensively, with an emphasis on chemical mechanisms. Prerequisite: CHEM 1123 and CHEM 1121L and CSES 2203, or instructor consent. (Typically offered: Spring Odd Years)

CSES 600V. Master's Thesis. 1-6 Hour. Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CSES 700V. Doctoral Dissertation. 1-18 Hour. Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Curriculum and Instruction (CIED) Courses

CIED 5003. Elementary Education Seminar. 3 Hours.

This course is designed to synthesize the foundational content presented in the Master of Arts in Teaching core courses. It focuses on refinement of the generalized knowledge to accommodate specialized content children. Professional attitudes, knowledge and skills relevant to elementary students. Professional attitudes, knowledge and skills applicable to today's elementary educator are addressed. Prerequisite: Admission to the CHED M.A.T. (Typically offered: Spring)

CIED 5013. Measurement, Research and Statistical Concepts in the Schools. 3 Hours.

An introduction to constructing, analyzing, and interpreting tests; types of research and the research process; qualitative and quantitative techniques for assessment; and descriptive and inferential statistics. Prerequisite: Admission to graduate school. (Typically offered: Summer)

CIED 5022. Classroom Management Concepts. 2 Hours.

A number of different classroom management techniques are studied. It is assumed that a teacher must possess a wide range of knowledge and skills to be an effective classroom manager. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5032. Curriculum Design Concepts for Teachers. 2 Hours.

The design and adaptation of curriculum for students in regular and special K-6 classrooms. Theoretical bases and curriculum models are reviewed. Concurrent clinical experiences in each area of emphasis are included. Prerequisite: Admission to the M.A.T. program. (Typically offered: Spring)

CIED 5053. Multicultural Issues in Elementary Education. 3 Hours.

This course provides an introduction to the major concepts and issues related to multicultural education in elementary classrooms. The ways in which race, class, gender and exceptionality influence students' behavior are discussed. Prerequisite: Admission to graduate school. (Typically offered: Spring Odd Years; Summer)

CIED 5063. Disciplinary and Interdisciplinary Literacies in Education. 3 Hours.

This course teaches the integration of reading, writing, and new literacies within the discipline and across disciplines. Theory and strategy are presented as integrated strands of the language process as presented in the context of instructional principles and suggested teaching practices. A solid research base is emphasized while keeping the focus on practical application. Prerequisite: Admission to Teacher Education M.A.T. Program. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

CIED 5073. Action Research in Elementary Education. 3 Hours.

Provides the students with experience in conducting case studies and action research related to childhood education. In addition, students gain knowledge regarding practices used in ethnographic research. Prerequisite: Admission to M.A.T. program. (Typically offered: Spring)

CIED 508V. Elementary Education Cohort Teaching Internship. 1-6 Hour.

Full-time student teaching in grades K-6 to be repeated both fall and spring semesters. Students will practice and master instructional strategies under the supervision of qualified mentor teachers and university faculty members. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 5153. Creativity in Daily Practice. 3 Hours.

(Formerly CIED 4083.) Arts integration course including the ideas, design, and implementation of practices in the classroom, board room, and professional field that enrich the experiences of all stakeholders while building right-brain thinking skills for the new millennium. Graduate degree credit will not be given for both CIED 4083 and CIED 5153. (Typically offered: Spring Even Years) May be repeated for up to 6 hours of degree credit.

CIED 5162. Applied Practicum. 2 Hours.

Provides laboratory experiences for CIED 5173 (Literacy Assessment and Intervention). Corequisite: CIED 5173. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5173. Literacy Assessment and Intervention. 3 Hours.

Focuses on assessment of young children's literacy skills. Techniques discussed include informal observation, miscue analysis, and portfolio assessment. Prerequisite: Admission to graduate school. (Typically offered: Fall and Summer)

CIED 5203. English Language Arts/Speech & Drama Methods of Instruction. 3 Hours.

This course provides an introduction to teaching English language arts (ELA) and speech/drama in the context of elementary, middle and high school settings. The topics, issues, methods, and materials encompassing philosophical, cognitive, and psychological dimensions of teaching the content area provide the major tenets of instruction. (Typically offered: Summer)

CIED 5213. Issues and Trends in Literacy. 3 Hours.

This course provides an examination of practices to teaching literacy, broadly defined. The topics, issues, methods, and materials encompassing philosophical, cognitive, and psychological dimensions of teaching provide the major tenets of instruction. Prerequisite: Admission to M.A.T. (EDUCMA) Secondary program or instructor consent. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

CIED 5223. Learning Theory. 3 Hours.

This course provides the student with information about foundational issues in education, including history and philosophy of American Education, psychological and social theories of education, characteristics of learners, and learning processes. Prerequisite: Admission to M.A.T. degree program. (Typically offered: Summer)

CIED 5232. Interdisciplinary Studies. 2 Hours.

Introduction to the nature of interdisciplinary study: curricular content, course planning (topics and themes), instructional strategies, and evaluation and assessment. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall, Spring and Summer)

CIED 5243. The Moral Mind in Action. 3 Hours.

(Formerly CIED 4433.) The Moral Mind in Action explores how people reason through moral dilemmas and prepares students to more effectively recognize and resolve moral problems. Best practices of teachers and administrators of K-16 character education programs are discussed. Graduate degree credit will not be given for both CIED 4433 and CIED 5243. (Typically offered: Fall)

CIED 5253. Moral Courage. 3 Hours.

(Formerly CIED 4443.) Moral Courage explores the factors that support translating moral thinking into moral action. This course draws from the field of positive psychology to guide students as they leverage existing strengths and develop new strategies for acting with moral courage in their personal and professional lives. Best practices of teachers and administrators of K-16 character education programs are discussed. Graduate degree credit will not be given for both CIED 4443 and CIED 5253. (Typically offered: Spring)

CIED 5263. Assessment, Evaluation, and Practitioner Research. 3 Hours.

A study of assessment, testing, and evaluative procedures in classrooms including types of tests, abuses of tests, test construction, scoring, analysis and interpretation, statistical methods, and alternative evaluation and assessment techniques. Classroom-based data collection and analysis. Prerequisite: Admission to the M.A.T. program. (Typically offered: Fall)

CIED 5273. Research in Curriculum and Instruction. 3 Hours.

An introduction to inquiry and research in curriculum and instruction. It examines the principles, strategies, and techniques of research, especially qualitative inquiry. Qualitative method in assessment and evaluation are considered. Practicum in educational research and evaluation is done as part of the class. (Typically offered: Fall)

CIED 528V. Teaching Experience. 1-6 Hour.

The teaching experience is an essential component of the Masters of Arts in Teaching degree. The two semester experience allows Teacher Candidates (TC) to make further application of theoretical principles of teaching and learning. Teacher Candidates will be assigned placement in area schools for both fall and spring semesters. The fall semester consists of a field experience including observation, co-planning, and co-teaching. The spring semester consists of an immersion experience for teacher candidates to plan and teach independently. Prerequisite: Admission to the M. A. T. Program (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 5313. Principles of Qualitative Research in Curriculum & Instruction. 3 Hours.

Designed specifically for aspiring qualitative researchers who wish to conduct research in settings unique to curriculum and instruction. Methods of research design, data analysis, and writing for publication will be emphasized. Strongly recommended for graduate students who are considering a qualitative thesis or dissertation in curriculum and instruction. (Typically offered: Spring Odd Years)

CIED 5333. Curriculum Theory and Development for Educators. 3 Hours.

The design and adaptation of curriculum for students in regular and special K-12 classrooms. Theoretical bases and curriculum models are reviewed. Concurrent clinical experiences in each area of emphasis are included. Prerequisite: Admission to the M.A.T. program. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

CIED 5363. Teaching in K-12 Online and Blended Classrooms. 3 Hours.

The study of curriculum, instructional methods and assessment techniques to facilitate student learning in K-12 virtual and blended teaching environments. Students enrolled in the course will be required to demonstrate knowledge of prevalent and relevant models of K-12 curriculum, web-based instructional methods, assessment techniques and utilize tools for the development and implementation of effective instruction in the K-12 virtual classroom. Prerequisite: Graduate standing. (Typically offered: Fall)

CIED 5393. Introduction to Linguistics. 3 Hours.

This course is an introduction to human language. The goal is to understand what it means to speak a language, including an introduction to phonetics and phonology (specifically the sound system of American English), morphology (the rules of English at the word level), syntax (rules that govern sentence level language), semantics (meanings of words) and sociolinguistics (or the study of language use in its social context). (Typically offered: Fall)

CIED 5423. Curriculum and Instruction: Models and Implementation. 3 Hours.

The study of models of curriculum and instruction and their implementation to facilitate student learning in a variety of instructional environments. (Typically offered: Spring)

CIED 5443. Methods of Teaching Foreign Language K-12. 3 Hours.

Study of the methods and materials in the teaching of foreign language in K-12 settings as well as the theories of second language acquisition. Includes philosophical, cognitive, and psychological dimensions of teaching foreign languages. The planning of instruction, microteaching, and the development of instructional materials are included. Prerequisite: Admission to the MAT program. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

CIED 5453. Evaluation Techniques. 3 Hours.

Evaluation of learning using traditional means of assessment as well as alternative or authentic assessment techniques. (Typically offered: Irregular)

CIED 5461. Capstone Research Seminar. 1 Hour.

This course provides students with basic knowledge and practical skills in understanding, utilizing and implementing a research design project with a focus in the discipline of curriculum and instruction with particular emphasis of some aspect of teaching and/or learning. As a part of this course students will design, conduct and report the results of an action research study undertaken in the teaching internship. Prerequisite: Admission to M.A.T. program. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

CIED 5513. Sound System of American English. 3 Hours.

This course will study the structure and development of American English (AE). Topics include: 1) the structure/systems of American English pronunciation, 2) vowels, 3) consonant system (including such features as minimal pairs, 4) prosody, intonation, rhythm, and stress, and 5) regionalism and social varieties, and 6) pedagogical approaches to teaching the features of American English. (Typically offered: Fall)

CIED 5523. Instructional Practices in Teaching Foreign Language. 3 Hours.

A pedagogical studies course based on the theoretical and practical aspects of methods, techniques, and materials for effective teaching of foreign languages in K-12 schools. Prerequisite: Admission to M.A.T. Program. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

CIED 5543. Structures of American English. 3 Hours.

This course provides an introduction to the grammars of English, including (but not restricted to) traditional, structural, and transformational-generative (universal grammar). It includes approaches to the teaching of all types of grammars. (Typically offered: Spring and Summer)

CIED 5553. Social Justice and Multicultural Issues in Education. 3 Hours.

This seminar provides an introduction to the major concepts and issues related to multicultural education and social justice in education and the ways in which race, ethnicity, class, gender, and exceptionality influence students' behavior. The course also examines the intersection of teacher and student perceptions of identity, schooling, and learning and the effects on educational systems. Prerequisite: Admission to MAT. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

CIED 5563. Teaching Internship/Action Research. 3 Hours.

During this course, Master's candidates will be provided with classroom time to prepare to teach and then will be assigned to a classroom or classrooms. During this time the candidates will have an opportunity (under supervision) to observe, to teach and to participate in classroom activities. Additionally, candidates will research some area of their own pedagogy relevant to the experience. (Typically offered: Irregular)

CIED 5573. Foundations of Literacy. 3 Hours.

Teaching of reading to children; techniques, research, and modern practices. (Typically offered: Fall, Spring and Summer)

CIED 5593. Advanced Diagnosis and Intervention. 3 Hours.

Emphasizes the diagnosis and remediation of reading difficulties in the classroom setting. Students are expected to become familiar with cause of reading failure, diagnosis instruments and procedures, principles of report writing, and corrective instructional methods and materials. The course is open to graduate students with instructor's consent. Enrollment limited to 20. Prerequisite: CIED 5573. (Typically offered: Irregular)

CIED 5683. Adolescent Literature. 3 Hours.

Content course in adolescent literature including selection, reading, evaluation, and psychological basis of classic and contemporary works. (Typically offered: Fall, Spring and Summer)

CIED 5713. Integrating the Elementary Curriculum. 3 Hours.

This course focuses on meaningful integration of science, mathematics, literacy, social studies, art, and music in the elementary classroom. A strong foundation for integrating the elementary curriculum will be developed by providing students with theoretical frameworks, research, resources, and methods related to classroom practice. Strategies to coordinate the integration of these subject areas for the K-4 classroom will be modeled. (Typically offered: Summer)

CIED 5723. Nature and Needs of Persons with Mild Disabilities. 3 Hours.

Educational, psychological, and social characteristics of individuals who have mild disabilities with emphasis on educational methods and modifications. Prerequisite: CIED 3023. (Typically offered: Fall)

CIED 5803. Nature and Needs of the Gifted and Talented. 3 Hours.

Educational, psychological, and social characteristics of gifted and talented children. Prerequisite: Graduate standing. (Typically offered: Fall)

CIED 5813. Curriculum Development in Gifted and Talented. 3 Hours.

Examines the various models for developing curriculum and providing services for students identified for gifted programs. Prerequisite: CIED 5803. (Typically offered: Spring)

CIED 5823. Gifted and Talented (Structured) Practicum. 3 Hours.

Supervised field experience in gifted education programs, schools, institutions, and other facilities for gifted/talented children. Prerequisite: CIED 5813. (Typically offered: Summer)

CIED 5843. Representations of American Education in Film. 3 Hours.

This course provides an examination of students, teachers, administrators, schools, and schooling as they exist on the silver screen. Of particular interest is how film representations and misrepresentations potentially affect public perceptions of education. This course draws on educational theory and the field of cultural studies. (Typically offered: Irregular)

CIED 5853. Issues in Mathematics Education. 3 Hours.

Study of research in mathematics education and applications to classroom teaching and learning. Emphasis will be given past and current research in the areas of students' cognitive development in mathematics, mathematics curriculum development, and teaching practices and assessment. (Typically offered: Irregular)

CIED 5913. Parent/Family Engagement for Culturally & Linguistically Diverse Students. 3 Hours.

Students will investigate characteristics of family-community engagement systems and models serving culturally and linguistically diverse (CLD) students and families. Identify qualities of a welcoming, accepting environment for CLD families and implement some of these characteristics in their classroom and schools. Support communication and facilitate contributions by CLD families to the school and community including leadership roles. Demonstrate knowledge, skills, best practices and resources to enhance CLD family-community engagement by developing and implementing a service-learning project in their school or community. Prerequisite: Graduate standing. (Typically offered: Summer)

CIED 5923. Second Language Acquisition. 3 Hours.

This is one of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course gives an introduction to the basics in research and learning theories involved in the acquisition of second languages and cultures, particularly ESL. (Typically offered: Fall)

CIED 5933. Second Language Methodologies. 3 Hours.

This is one of a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course introduces the basics in approaches, methodologies, techniques, and strategies for teaching second languages, especially ESL. (Typically offered: Spring)

CIED 5943. Teaching People of Other Cultures. 3 Hours.

This is one in a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course focuses on cultural awareness, understanding cultural differences, and instruction methods for integrating second cultures, especially the culture of the United States, into the curriculum. (Typically offered: Fall)

CIED 5953. Second Language Assessment. 3 Hours.

This is one in a series of four courses leading to Arkansas approved endorsement for teaching English as a Second Language (ESL). The course introduces basic methods for testing, assessing and evaluating second language, especially ESL, learners for placement purposes and academic performance. (Typically offered: Spring)

CIED 5973. Practicum in Secondary Education. 3 Hours.

Students will engage in action research in a school setting to advance their knowledge of teaching and learning venues including schools and informal learning environments. Prerequisite: Permission. (Typically offered: Fall and Spring)

CIED 5983. Practicum in Curriculum & Instruction. 3 Hours.

This course will provide degree candidates with advance knowledge of teaching in the elementary or secondary schools. This will be accomplished through a semester-long practicum during which an action research project will be designed, enacted, and reported. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

CIED 599V. Special Topics. 1-18 Hour.

Special topics. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

CIED 600V. Master's Thesis. 1-6 Hour.

This course is designed for students completing a thesis at the master's level in curriculum and instruction and related programs. It may be taken multiple times for 1-6 credits but no more than 6 credits will be counted toward the degree. Prerequisite: Graduate Standing (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CIED 6013. Curriculum Theory, Development, and Evaluation. 3 Hours.

Principles and concepts of curriculum and development, with an analysis of the factors basic to planning, the aims of the educational program, the organization of the curriculum, curriculum models, and elements desirable in the curriculum of schools including evaluation. (Typically offered: Fall Odd Years)

CIED 6023. Instructional Theory. 3 Hours.

Study of psychological, anthropological, sociological, and educational theories of instruction and learning. Emphasis is placed on synthesizing a broad range of existing and emerging perspectives in understanding individual, interactional and contextual phenomena of instruction and learning. (Typically offered: Spring Even Years)

CIED 6033. Content Specific Pedagogy. 3 Hours.

This course explores the relationship between the content of courses taught in schools and the pedagogical principles that the teaching of the content requires. Students will discuss and synthesize findings from the research literature and from personal investigation. (Typically offered: Irregular)

CIED 6043. Analysis of Teacher Education. 3 Hours.

This course examines issues, problems, trends, and research associated with teacher education programs in early childhood, elementary, special education, and secondary education. Prerequisite: CIED 6023. (Typically offered: Summer Even Years)

CIED 6053. Curriculum and Instruction: Learner Assessment and Program Evaluation. 3 Hours.

This course provides an overview of designing, implementing and analyzing learner assessments as well as systemic and program evaluations in a variety of instructional environments. (Typically offered: Spring Even Years)

CIED 6073. Seminar in Developing Creativity. 3 Hours.

A study of the facets of creativity, how they can be applied to be used in one's everyday life, how they can be applied in all classrooms, and how to encourage the development of these in students. (Typically offered: Irregular)

CIED 6083. Piaget's Theory and Instruction. 3 Hours.

Piaget's theory has been applied to classroom instruction in various settings. This course will investigate the theory in depth, study classroom application, and students will devise application. Prerequisite: CIED 6023. (Typically offered: Spring Odd Years)

CIED 6093. Vygotsky in the Classroom. 3 Hours.

This course introduces the cultural-historical theory of L. Vygotsky and considers its complexity. The comprehensive nature of Vygotsky's heritage and the importance of the sociocultural context for understanding his work is emphasized, as well as the implications of his theories for contemporary educational settings. (Typically offered: Fall Even Years)

CIED 6123. New Literacy Studies. 3 Hours.

In the past decade scholars have expressed an interest in the diverse literacy practices in which adolescents engage outside of school. In using new media, adolescents interweave multiple sign system, including word and image, to construct a narrative or communicate information. How do readers interpret these texts? What conventions do authors manipulate to influence the meanings they construct? This course aims to answer these and other questions. (Typically offered: Fall Odd Years) May be repeated for up to 12 hours of degree credit.

CIED 6133. Trends and Issues in Curriculum and Instruction. 3 Hours.

Analysis of trends and issues in curriculum and instruction with emphasis on political/social contexts and prevailing philosophies/theories/practices across disciplines. Prerequisite: Admittance in Ed.D, Ed.S. or Ph.D. program. (Typically offered: Fall Even Years)

CIED 6143. Differentiated Instruction for Academically Diverse Learners. 3 Hours.

Major focus of this course will be the examination of differentiated instruction, a teaching philosophy appropriate for a wide range of learners. (Typically offered: Summer Even Years)

CIED 6153. Theories of Literacy Learning. 3 Hours.

In this seminar, students consider theories of literacy learning and their implications for practice and research. Theories are viewed as historically and socially situated, and students reflect on how their own work might be situated within these theories. The ways in which theories support research methodology are also explored. (Typically offered: Spring Odd Years)

CIED 6163. Social and Emotional Components of Gifted and Talented Students. 3 Hours.

Purpose of this course is to study the theoretical and practical aspects of those affective issues, behaviors, and experiences often associated with gifted and talented students. (Typically offered: Summer Even Years)

CIED 6173. Reviews of Research in Reading Comprehension. 3 Hours.

In this online course, students will learn types of reviews of research, including qualitative systematic reviews and meta-analyses, and will conduct a review of research on a topic related to reading comprehension. Students will consider implicit and explicit definitions of comprehension and the influence various definitions have on assessment, instruction, policy and research and will examine comprehension in different contexts, disciplines, genres, and platforms. The course is a CIED Area of Study or Cognate Course (not part of the Inquiry Core). (Typically offered: Summer Even Years)

CIED 6183. Theory and Research in Arts Integration. 3 Hours.

Content course in arts integration including the pedagogy, design, and implementation of lesson plans which simultaneously address core curriculum learning targets and teach skills through the visual and performing arts in order to address the needs of the learners of the new millennium. Prerequisite: Instructor consent. (Typically offered: Spring and Summer)

CIED 6193. Teaching English Language Learners in the Content Areas. 3 Hours.

This course prepares teachers to teach English language learners in math, science, and social studies. These subject areas each have their own vocabulary that must be mastered by English language learners. The course focuses on teachers of both children and adults. (Typically offered: Spring)

CIED 6243. Bakhtin in Language, Literacy, and Research. 3 Hours.

This seminar course explores a growing body of theory, research, and applications inspired by the ideas of Russian scholar Mikhail M. Bakhtin, who provides a unique perspective on language, literacy, and culture. Bakhtin's focus on the process of meaning-making through dialogic interaction is relevant for educators in all academic areas. Bakhtin's ideas provide a powerful humanistic alternative to prevailing formalistic tendencies in studying language, culture, and education. Many modern orientations, such as discourse analysis and dialogic pedagogy, can be traced to Bakhtinian concepts. In addition to exploring Bakhtinian concepts in language and literacy, this course applies a Bakhtinian framework for research. (Typically offered: Fall Odd Years)

CIED 6313. Issues, History, and Rationale of Science Education. 3 Hours.

This course is the foundation experience for those interested in the discipline of science education. It provides an overview of the fundamental issues in and vocabulary of science education. The course includes the research basis for science teaching, the literature of science education, and the issues and controversies surrounding the teaching of science. (Typically offered: Irregular)

CIED 6333. Nature of Science: Philosophy of Science for Science Educators. 3 Hours.

The Nature of Science is a hybrid arena consisting of aspects of the philosophy, history and sociology of science along with elements of the psychology of scientific observations all targeting the complete understanding of how science actually functions. Prerequisite: Admission to grad school. (Typically offered: Irregular)

CIED 6343. Advanced Science Teaching Methods. 3 Hours.

This course is designed for those educators who have had some previous instruction in science teaching methods and/or had some prior science teaching experience. Students will gain new or renewed perspectives with respect to their personal teaching ability while engaging in discussions and activities designed to assist others in professional growth in science instruction. Prerequisite: Admission to graduate school. (Typically offered: Irregular)

CIED 6443. Mixed Methods Research. 3 Hours.

This course will provide opportunities for students to acquire the skills, knowledge, and strategies necessary to design and implement a mixed methods research study. Emphasis is upon developing research questions, developing a research design, selecting a sample, and utilizing appropriate techniques for analyzing data. (Typically offered: Fall)

CIED 6533. Problem-Based Learning and Teaching. 3 Hours.

A course in the design, development, and delivery of the problem-based learning (PBL) model. Theoretical cases and curriculum models will be centered on issues and models related to PBL. (Typically offered: Irregular)

CIED 6603. Multicultural Education. 3 Hours.

This course is designed to trace, examine, discuss, and promote understanding of issues related to multicultural education, different views of multicultural education, and the impact of multicultural education upon the schooling process. Emphasis is upon schooling experiences of culturally diverse students, language issues, gender issues, and evaluation issues. Prerequisite: Admission to the Ed.S. or Ph.D. program. (Typically offered: Spring)

CIED 6623. Research Methods and Scholarship in Curriculum and Instruction. 3 Hours.

In this course students will look at methods and practices in writing a successful dissertation proposal. Emphasis will be placed on research studies, collection of reliable and valid data, and analysis of data. Throughout the course, topics will focus on what scholarship looks like in curriculum and instruction. Prerequisite: Advanced standing in the doctoral program. (Typically offered: Fall)

CIED 674V. PhD Research Internship. 1-6 Hour.

This research internship is for doctoral level students in curriculum and instruction. The goal is provide research experience within the doctoral course of study. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

CIED 680V. Ed.S. Project. 1-6 Hour.

Instructor permission required to register. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

CIED 684V. PhD Teaching Internship. 1-6 Hour.

This teaching internship is for doctoral level students in curriculum and instruction. The goal is to provide teaching experience within the doctoral course of study. (Typically offered: Fall, Spring and Summer)

CIED 694V. Special Topics. 1-6 Hour.

Discussion and advanced studies on selected topics in curriculum and instruction. Specific focus on recent developments. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

CIED 695V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer)

CIED 699V. Doctoral Seminar. 1-3 Hour.

Doctoral seminar. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

CIED 700V. Dissertation. 1-18 Hour.

Dissertation. Prerequisite: Candidacy (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Economics (ECON)

Courses

ECON 5243. Managerial Economics. 3 Hours.

This course will provide students with a strong foundation in core economics principles, with emphasis on industrial organization issues and applications geared toward the supply-chain and retail focus of the redesigned MBA program. (Typically offered: Fall and Spring)

ECON 5253. Economics of Management and Strategy. 3 Hours.

Information economics and applied game theory. (Typically offered: Irregular)

ECON 5263. Applied Microeconomics. 3 Hours.

The framework for this course is the economic way of thinking. Both the theory and application of important economics questions are presented, showing students the applicability of various economic methodologies in a number of different contexts. To gain competence in the applied side of economic analysis, students will use MS Excel or other software to apply class concepts to solve concrete problems. Prerequisite: ECON 5243 and (ECON 5743 or AGECE 5613). (Typically offered: Spring)

ECON 537V. Global Business. 1-3 Hour.

Integrated overview of the global business environment and the organizational challenges of a multinational firm. To enhance understanding of the business and cultural environment of prominent emerging markets, the course includes a 2-3 week overseas immersion project to fulfill a predefined goal. Project is integrated with global content upon return. (Typically offered: Fall and Spring)
This course is cross-listed with MGMT 537V.

ECON 5423. Behavioral Economics. 3 Hours.

(Formerly ECON 4423.) Both economics and psychology systematically study human judgment, behavior, and well-being. This course surveys attempts to incorporate psychology into economics to better understand how people make decisions in economic situations. The course will cover models of choice under uncertainty, choice over time, as well as procedural theories of decision making. Graduate degree credit will not be given for both ECON 4423 and ECON 5423. Prerequisite: ECON 2023 or ECON 2143. (Typically offered: Spring)

ECON 5433. Experimental Economics. 3 Hours.

(Formerly ECON 4433.) The course offers an introduction to the field of experimental economics. Included are the methodological issues associated with developing, conducting, and analyzing controlled laboratory experiments. Standard behavioral results are examined and the implications of such behavior for business and economic theory are explored. Graduate degree credit will not be given for both ECON 4433 and ECON 5433. Prerequisite: ECON 2023 or ECON 2143. (Typically offered: Fall)

ECON 5743. Introduction to Econometrics. 3 Hours.

(Formerly ECON 4743.) Introduction to the application of statistical methods to problems in economics. Graduate degree credit will not be given for both ECON 4743 and ECON 5743. Prerequisite: ((ECON 2013 and ECON 2023) or ECON 2143) and ((MATH 2043 or MATH 2554 or higher)) and (WCOB 1033 or STAT 2303). (Typically offered: Spring)

ECON 5753. Forecasting. 3 Hours.

(Formerly ECON 4753.) The application of forecasting methods to economics, management, engineering, and other natural and social sciences. The student will learn how to recognize important features of time series and will be able to estimate and evaluate econometric models that fit the data reasonably well and allow the construction of forecasts. Graduate degree credit will not be given for both ECON 4753 and ECON 5753. Prerequisite: (ECON 2013 and ECON 2023) or (ECON 2143) and (MATH 2043 or MATH 2554) and (WCOB 1033 or STAT 2303). (Typically offered: Fall)

ECON 5763. Economic Analytics. 3 Hours.

This course provides students with a good overview of modern big data methods, including Machine Learning, along with hands-on experience of in-depth analytics projects using real data. After 3 weeks of introductory lectures on the big data methods by the instructor, students will form groups and propose research projects they will develop over the semester. Knowledge of some statistical software is recommended, including Python, R and MATLAB. Prerequisite: (ECON 5743 or AGECE 5613) and ECON 5783. (Typically offered: Spring)

ECON 5783. Applied Microeconometrics. 3 Hours.

This course covers the principles of causal inference. Methods include panel data models, instrumental variables, regression discontinuity designs, difference-in-differences, and matching. Emphasis on developing a solid understanding of the underlying econometric principles of the methods taught as well as on their empirical application. Prerequisite: ECON 5743 or AGECE 5613. (Typically offered: Fall)

ECON 5853. International Economics Policy. 3 Hours.

An intensive analysis of the operation of the international economy with emphasis on issues of current policy interest. (Typically offered: Irregular)

ECON 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ECON 6133. Mathematics for Economic Analysis. 3 Hours.

This course will develop mathematical and statistical skills for learning economics and related fields. Topics include calculus, static optimization, real analysis, linear algebra, convex analysis, and dynamic optimization. Prerequisite: Graduate standing and MATH 2554 or equivalent. (Typically offered: Summer)

ECON 6213. Microeconomic Theory I. 3 Hours.

Introductory microeconomic theory at the graduate level. Mathematical formulation of the consumer choice, producer behavior, and market equilibrium problems at the level of introductory calculus. Discussion of monopoly, oligopoly, public goods, and externalities. (Typically offered: Fall)

ECON 6223. Microeconomic Theory II. 3 Hours.

Advanced treatment of the central microeconomic issues using basic real analysis. Formal discussion of duality, general equilibrium, welfare economics, choice under uncertainty, and game theory. (Typically offered: Spring)

ECON 6313. Macroeconomic Theory I. 3 Hours.

Theoretical development of macroeconomic models that include and explain the natural rate of unemployment hypothesis and rational expectations, consumer behavior, demand for money, market clearing models, investment, and fiscal policy. (Typically offered: Fall)

ECON 6323. Macroeconomic Theory II. 3 Hours.

Further development of macroeconomic models to include uncertainty and asset pricing theory. Application of macroeconomic models to explain real world situations. (Typically offered: Spring)

ECON 636V. Special Problems in Economics. 1-6 Hour.

Independent reading and investigation in economics. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

ECON 643V. Seminar in Economic Theory and Research I. 1-3 Hour.

Seminar. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

ECON 644V. Seminar in Economic Theory and Research II. 1-3 Hour.

Independent research and group discussion. (Typically offered: Spring)

ECON 6543. Seminar in Advanced Economics II. 3 Hours.

This seminar will cover advanced fields of current research importance in economics. This will facilitate the development of research directions for doctoral study and research. Prerequisite: Graduate standing. (Typically offered: Irregular)

ECON 6613. Econometrics I. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. The single equation model is examined emphasizing multicollinearity, autocorrelation, heteroskedasticity, binary variables and distributed lags. Prerequisite: MATH 2043 and knowledge of matrix methods, which may be acquired as a corequisite, and ECON 2023, and an introductory statistics course or equivalent. (Typically offered: Fall)

ECON 6623. Econometrics II. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. The treatment of measurement error and limited dependent variables and the estimation of multiple equation models and basic panel data models will be covered. Additional frontier techniques may be introduced. Prerequisite: ECON 6613. (Typically offered: Spring)

ECON 6633. Econometrics III. 3 Hours.

Use of economic theory and statistical methods to estimate economic models. Nonlinear and semiparametric/nonparametric methods, dynamic panel data methods, and time series analysis (both stationary and nonstationary processes) will be covered. Additional frontier techniques may be covered. Prerequisite: ECON 6613. (Typically offered: Spring)

ECON 6713. Industrial Organization I. 3 Hours.

This course will develop the theory of modern industrial organization. The latest advances in microeconomic theory, including game theory, information economics and auction theory will be applied to understand the behavior and organization of firms and industries. Theory will be combined with empirical evidence on firms, industries and markets. Prerequisite: ECON 6213 and ECON 6223. (Typically offered: Fall)

ECON 6723. Industrial Organization II. 3 Hours.

This course surveys firm decisions, including setting prices, choosing product lines and product quality, employing price discrimination, and taking advantage of market structure. It will also cover behavioral IO, which reconsiders the assumption that firms and consumers are perfectly rational and examines the role of regulation. Prerequisite: ECON 6133. (Typically offered: Spring)

ECON 6833. International Trade and Development I. 3 Hours.

A first graduate level course in development economics with a focus on foundational theoretical issues. We explore the causation, implications, and remedies for pervasive and persistent poverty in low-income countries. Emphasis will be primarily on microeconomics topics. May be taken either as a precursor to International Development Economics II or stand-alone. Prerequisite: ECON 6213, (ECON 6613 or AGECE 5613) or by instructor's permission. (Typically offered: Fall)

ECON 6843. International Trade and Development II. 3 Hours.

A second graduate level course in development economics that focuses on the empirical aspect of development in low-income countries. The course explores various microeconomics topics related to poverty, human capital accumulation, and their interactions with role of public policy. Prerequisite: ECON 6213, (ECON 6613 or AGECE 5613) or instructor consent. (Typically offered: Spring)

ECON 6913. Experimental Economics. 3 Hours.

The course develops advanced concepts in the use of controlled experiments to test economic theory and explore behavioral regularities relating to economics. The class focuses on the methodology of experimental economics while reviewing a variety of established results. Prerequisite: ECON 6213. (Typically offered: Fall)

ECON 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Education Reform (EDRE) Courses

EDRE 5053. Philosophy and History of Education and Education Reform. 3 Hours.

This course traces the historical development of the philosophical debates concerning education and its role in society as well as how those ideas and consequent demands for reform affected the educational system and its structures. (Typically offered: Spring Even Years)

EDRE 5113. Education Policy in Israel. 3 Hours.

This course, which is built around a study abroad component in Israel, examines education policy in Israel. It will compare US and Israeli perspectives and ideas on education reform and education innovation in diverse societies. (Typically offered: Summer Even Years)

EDRE 6023. Economics of Education. 3 Hours.

This course applies the principles of economic analysis to education and education reform. Topics include: Human capital and signaling theories; education labor markets; educational production functions; public policy and market forces. The course also features empirical evidence evaluating economic theories of education. (Typically offered: Spring Odd Years)

EDRE 6033. Politics of Education. 3 Hours.

This course explores historical and institutional forces that help shape education policymaking. Particular attention will be paid to the experience of past education reform movements as well as the influence of interest groups, federalism, bureaucracy, governance structures, public opinion, and judicial review on education policy. (Typically offered: Fall)

EDRE 6043. Finance and Education Policy. 3 Hours.

This course examines K-12 education finance from the standpoint of education reform policy. The tools of analysis include economics, public finance, law and political science. Topics include: revenue sources and fiscal federalism, standards-based reform and school finance, school funding formulas, adequacy lawsuits, the politics of school funding, school funding and markets. The course also features empirical evidence on the educational impact of education finance. (Typically offered: Spring Even Years)

EDRE 6053. Measurement of Educational Outcomes. 3 Hours.

This course will train students to consider the various types of outcome and assessment measures used for education at the K-12 level throughout the United States; further, the students will engage in analyses of research that relies on these various outcome measures. (Typically offered: Fall)

EDRE 6103. Quantitative Analytical Techniques for Education Policy. 3 Hours.

This course introduces students to the quantitative techniques required for the evaluation of education policies and interventions. The class will focus on the identification and estimation of causal effects, necessary assumptions, and how to deal with the failure of these assumptions. Major topics covered include randomized experiments, the ordinary least squares regression method, matching estimators, instrumental variable methods, regression discontinuity, difference in difference methods, and introduction to estimation strategies with panel data models. (Typically offered: Fall)

EDRE 6123. Intermediate Quantitative Analytical Techniques for Education Policy. 3 Hours.

This course builds on the content presented in EDRE 6103 by delving more deeply into benefits and limitations of the Ordinary Least Squares (OLS) estimator while also introducing the student to new estimation techniques. Students will be introduced to panel data estimation techniques, methods for robust inferences, and use of the Maximum Likelihood estimator for estimating binary and multinomial choice models. Students will also expand on their knowledge of how to implement STATA in practical research settings. Prerequisite: EDRE 6103. (Typically offered: Spring)

EDRE 6143. Advanced Quantitative Analytical Techniques for Education Policy. 3 Hours.

This course introduces students to advanced estimation methods and empirical models often used in education policy empirical research, such as Maximum Likelihood to estimate discrete choice models, censored models and selection models, duration models, Generalized Method of Moments to estimate dynamic panel data models, and bootstrapping of standard errors and simulation-based inference. Prerequisite: EDRE 6103. (Typically offered: Spring)

EDRE 6213. Program Evaluation and Research Design. 3 Hours.

This course provides students with training in the methods used to generate evidence-based answers to questions regarding the efficacy and impacts of education programs. The central questions that motivate most educational program evaluations are: (1) What is the problem? (2) What policies or programs are in place to address the problem? (3) What is their effect? (4) What works better? (5) What are the relative benefits and costs of alternatives? (Typically offered: Fall)

This course is cross-listed with ESRM 6613.

EDRE 6223. Research Seminar in Education Policy. 3 Hours.

This course provides students with the opportunity to learn about education policy research by interacting directly with the leading scholars and practitioners in the field. Students will also gain a foundation in the field of education policy research by reading and discussing some of the founding works of the field. (Typically offered: Fall)

EDRE 636V. Special Problems. 1-6 Hour.

Independent reading and investigation in education policy under faculty supervision. Prerequisite: Approval of EDRE Graduate Director. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

EDRE 6413. Issues in Education Policy. 3 Hours.

This course examines how K-12 education policy is designed and implemented in the United States. Students will develop a working knowledge of policymaking frameworks to examine major education policies of current interest and debate key policy issues that arise at each level of government. In great measure, the goals of the course will be accomplished through the consideration of opposing stances on key educational policy debates and issues that are of current import. (Typically offered: Spring)

This course is cross-listed with EDFD 5683.

EDRE 6423. Seminar in School Choice Policy. 3 Hours.

This course examines parental school choice - perhaps the most controversial education reform of our age. Students will be introduced to the full set of school choice policies, including charter schools and vouchers, and evaluate their benefits and drawbacks as educational interventions. (Typically offered: Fall Even Years)

EDRE 6433. Seminar in Education Accountability Policy. 3 Hours.

This course examines K-12 school and district accountability under state and Federal law (e.g. NCLB), as well as teacher and student accountability (e.g. exit exams). Topics include the theory of incentives and politics of tradeoffs, measurement issues of policy implementation, and statistical evidence on policy effects on performance. (Typically offered: Spring Odd Years)

EDRE 6443. Seminar in Education Leadership Policy. 3 Hours.

This course will examine the individual and systemic prerequisites of effective leadership of schools and school systems, and effective leadership techniques. It will consider the differences between public and private sector leadership. It will also explore ways to identify effective and ineffective leaders, and design and evaluate systems to recruit and train the former and reassign the latter. (Typically offered: Fall Odd Years)

EDRE 6453. Seminar in Teacher Quality and Public Policy. 3 Hours.

Examines how our public system of education shapes the preparation and continued professional development of K-12 teachers, and how that system has been influenced by standards-based education reform as well as efforts to enhance the quality of teaching and learning in public schools. Uses education reform legislation in several states as case studies to illustrate the successes and pitfalls of attempts to reform teacher education and licensure through public policy. (Typically offered: Spring Even Years)

EDRE 6463. Psychology of Education. 3 Hours.

This course explores psychological science findings that pertain to education research and policy with a focus on empirical evidence. Particular emphasis will be on studying individual differences in the context of education. Historical, methodological, and measurement perspectives will be introduced and psychological constructs studied and applied in educational contexts will be examined. (Typically offered: Spring Odd Years)

EDRE 674V. Internship in Education Policy. 1-6 Hour.

Internship at a public or private entity involved in the making or implementation of education policy. Paper required on a significant aspect of the internship experience. Prerequisite: Approval of EDRE Graduate Director. (Typically offered: Irregular)

EDRE 699V. Special Topics. 1-3 Hour.

Topics vary depending on instructor. Prerequisite: Approval of EDRE Graduate Director. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

EDRE 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Irregular) May be repeated for degree credit.

Educational Foundations (EDFD) Courses

EDFD 5373. Psychological Foundations of Teaching and Learning. 3 Hours.

Psychological principles and research applied to classroom learning and instruction. Social, emotional, and intellectual factors relevant to topics such as readiness, motivation, discipline, and evaluation in the classroom. (Typically offered: Irregular)

EDFD 5573. Life-Span Human Development. 3 Hours.

Basic principles of development throughout the human life-cycle. Physical, cognitive, social, emotional, and personality development. (Typically offered: Fall, Spring and Summer)

EDFD 5683. Issues in Educational Policy. 3 Hours.

This course examines how K-12 education policy is designed and implemented in the United States. Students will develop a working knowledge of policymaking frameworks to examine major education policies of current interest and debate key policy issues that arise at each level of government. (Typically offered: Fall, Spring and Summer)

This course is cross-listed with EDRE 6413.

Educational Leadership (EDLE) Courses

EDLE 5003. Schools and Society. 3 Hours.

Schools and Society is an introduction to the social, structural, political and historical forces that have created the American school system. (Typically offered: Summer Even Years)

EDLE 5013. School Organization and Administration. 3 Hours.

Analysis of structure and organization of American public education; fundamental principles of school management and administration. (Typically offered: Fall; Summer Odd Years)

EDLE 5023. The School Principalship. 3 Hours.

Duties and responsibilities of the public school building administrator; examination and analysis of problems, issues, and current trends in the theory and practice of the principalship. (Typically offered: Spring and Summer)

EDLE 5033. Psychology of Learning. 3 Hours.

This course prepares educational leaders to create and sustain a learning centered environment in school settings. Students will study learning theory across the lifespan and apply it to the practice of instructional leadership, curriculum design, and staff development. (Typically offered: Spring; Summer Odd Years)

EDLE 5043. Leadership Ethics. 3 Hours.

Leadership Ethics is an experiential based course grounded in ethical decision making theory that uses case study and practice to study school based ethical dilemmas. (Typically offered: Fall; Summer Odd Years)

EDLE 5053. School Law. 3 Hours.

Legal aspects of public and private schooling: federal and state legislative statutes and judicial decisions, with emphasis upon Arkansas public education. (Typically offered: Fall; Summer Odd Years)

EDLE 5063. Instructional Leadership, Planning, and Supervision. 3 Hours.

Instructional Leadership, Planning, and Supervision is designed to prepare practitioners to seize the role of educational leader at the school site level through the development of a vision that will be used to drive a data driven instructional school plan. (Typically offered: Fall; Summer Odd Years)

EDLE 5073. Research for Leaders. 3 Hours.

This course introduces research methodology that will support school leaders as consumers of educational research and supervisors of action research within their schools. Practical application of research for school leaders is emphasized. (Typically offered: Spring; Summer Odd Years)

EDLE 5083. Analytical Decision-Making. 3 Hours.

Analytical Decision Making is a performance based examination of the principles and practices related to the building administrator's role in the development, administration, and evaluation of curricular programs in public schools. This includes creating a school culture, fostering communication, aligning curriculum with state mandated standards, and staff development. (Typically offered: Spring Even years; Summer)

EDLE 5093. Effective Leadership for School Improvement. 3 Hours.

A performance based examination of strategic planning, group facilitation and decision-making, organizational behavior and development, professional ethics and standards, student services administration, and principles of effective leadership. (Typically offered: Spring and Summer)

EDLE 574V. Internship. 1-6 Hour.

Supervised in-school/district experiences individually designed to afford opportunities to apply previously-acquired knowledge and skills in administrative workplace settings. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

EDLE 599V. Seminar. 1-6 Hour.

Important foundational topics in educational leadership that are current and critical will be taught in this Master's-level seminar. Topics range from the psychology of learning and leading to how schools and society interact in the 21st century. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

EDLE 6013. Problems of Practice for Educational Leaders. 3 Hours.

Problems of Practice is designed to extend and refine students' thinking, experience, and knowledge about the Education Doctorate (EdD), as well as selecting a Problem of Practice that can contribute to the following program goals: advanced analytical reasoning skills; positive impact on professional practice; and the refinement of the scholar-practitioner. (Typically offered: Summer)

EDLE 6023. School Facilities Planning and Management. 3 Hours.

School facilities planning, management, cost analysis, operations, and maintenance of the school plant. (Typically offered: Fall Odd Years)

EDLE 6053. School-Community Relations. 3 Hours.

Community analysis, politics and education; power groups and influences; school issues and public responses; local policy development and implementation; effective communication and public relations strategies. (Typically offered: Spring Even Years)

EDLE 605V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 6093. School District Governance: The Superintendency. 3 Hours.

Analysis of the organizational and governance structures of American public education at national, state, and local levels. (Typically offered: Fall Even Years)

EDLE 6103. School Finance. 3 Hours.

Principles, issues and problems of school funding formulae and fiscal allocations to school districts. (Typically offered: Spring Odd Years)

EDLE 6173. School Business Management. 3 Hours.

Fiscal and resource management in public schools: budgeting, insurance, purchasing, and accounting. (Typically offered: Summer Odd Years)

EDLE 6333. Advanced Legal Issues in Education. 3 Hours.

The examination and discussion of advanced legal issues affecting public school education. Prerequisite: Advanced graduate standing. (Typically offered: Fall Even Years)

EDLE 6433. Legal Aspects of Special Education. 3 Hours.

A study of litigation and legislation in special education, federal and state laws and court cases, and due process hearings. (Typically offered: Irregular)

This course is cross-listed with SPED 6433.

EDLE 6503. Topics in Educational Research for School Administration. 3 Hours.

Application of educational research in the school setting by educational administrators. Emphasis placed on the use of state and local school or district data, data analysis, interpretation and reporting, hands-on experience with SPSS, and the formal process of writing a research report. Prerequisite: Advanced graduate standing. (Typically offered: Fall Odd Years)

EDLE 6513. Program Evaluation in Education. 3 Hours.

Program Evaluation in Education is designed to introduce students to concepts and methods of policy and program evaluation. Emphasis will be placed on preparing educational leadership students to conduct a program evaluation specialist project of dissertation. (Typically offered: Summer)

EDLE 6533. Educational Policy. 3 Hours.

Examination of the research and theory related to the evolution of local, state, and federal governance and educational policy. Emphasis given to the consideration of procedures involving policy formulation, implementation, and analysis. (Typically offered: Spring Odd Years)

EDLE 6543. Introduction to Qualitative Research. 3 Hours.

This course offers an introduction to the qualitative approach to research in the Social Sciences. In particular, this course focuses on initial qualitative research designs that support planning, problem solving, and evaluation for educational leaders. Developing a conceptual framework, gaining an initial understanding of the methods of data collection and analysis, and establishing credibility in qualitative research are discussed. This course will be taught online using Blackboard and will require synchronous online class meetings that will require a webcam and microphone. (Typically offered: Fall)

EDLE 6553. Advanced Qualitative Methods in Educational Research. 3 Hours.

This course has been designed to provide graduate students with a more in-depth understanding of qualitative research methods. Emphasis will be placed on preparing educational leadership students to design a qualitative or mixed-method dissertation study. Prerequisite: ESRM 6543 or HRWD 572V. (Typically offered: Spring)

EDLE 674V. Internship. 1-6 Hour.

Internship. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 680V. Educational Specialist Project. 1-6 Hour.

An original project, research project, or report required of all Ed.S. Degree candidates. Prerequisite: Admission to the Ed.S. program. (Typically offered: Fall, Spring and Summer)

EDLE 699V. Seminar. 1-6 Hour.

Seminar. Prerequisite: Advanced graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EDLE 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Educational Statistics and Research Methods (ESRM) Courses

ESRM 5013. Research Methods in Education. 3 Hours.

General orientation course which considers the nature of research problems in education and the techniques used by investigators in solving those problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

ESRM 5393. Statistics in Education and Health Professions. 3 Hours.

Applied statistics course for Master's degree candidates. Includes concepts and operations for frequency distributions, graphing techniques, measures of central tendency and variation, sampling, hypothesis testing, and interpretation of statistical results. (Typically offered: Fall, Spring and Summer)

ESRM 5653. Educational Assessment. 3 Hours.

Introduction to measurement issues and basic test theory. Focus on types and usage of assessment tools, data management, and analysis and interpretation of educational data. Practical training in the utilization and interpretation of academic achievement data in Arkansas. (Typically offered: Irregular)

ESRM 599V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ESRM 605V. Independent Study. 1-6 Hour.

Independent study. (Typically offered: Fall, Spring and Summer)

ESRM 6403. Educational Statistics and Data Processing. 3 Hours.

Theory and application of frequency distributions, graphical methods, central tendency, variability, simple regression and correlation indexes, chi-square, sampling, and parameter estimation, and hypothesis testing. Use of the computer for the organization, reduction, and analysis of data (required of doctoral candidates). Prerequisite: ESRM 5013 or ESRM 5393 or an equivalent course, each with a grade of C or better. (Typically offered: Fall, Spring and Summer)

ESRM 6413. Experimental Design in Education. 3 Hours.

Principles of experimental design as applied to educational situations. Special emphasis on analysis of variance techniques used in educational research. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Spring)

ESRM 6423. Multiple Regression Techniques for Education. 3 Hours.

Introduction to multiple regression procedures for analyzing data as applied in educational settings, including multicollinearity, dummy variables, analysis of covariance, curvi-linear regression, and path analysis. Prerequisite: ESRM 6403 with a grade of C or better or an equivalent course with a grade of C or better. (Typically offered: Fall)

ESRM 6453. Applied Multivariate Statistics. 3 Hours.

Multivariate statistical procedures as applied to educational research settings including discriminant analysis, principal components analysis, factor analysis, canonical correlation, and cluster analysis. Emphasis on use of existing computer statistical packages. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Spring)

ESRM 6513. Hierarchical Linear Modeling. 3 Hours.

This course covers the theory and applications of hierarchical linear modeling (HLM) also known as multilevel modeling. Both the conceptual and methodological issues for analyses of nested (clustered) data in using HLM will be reviewed, including linear models, non-linear models, growth models, and some alternative designs. Prerequisite: ESRM 6413 and ESRM 6423, both with a grade of C or better. (Typically offered: Fall Even Years)

ESRM 6523. Structural Equation Modeling. 3 Hours.

This course provides a detailed introduction to structural equation modeling (SEM) based on students' previous knowledge of multiple linear regression. Topics include path analysis, confirmatory factor analysis, full latent variable models, estimation techniques, data-model fit analysis, model comparison, and other topics, potentially equivalent models, specification searches, latent mean models, parameter invariance, multi-group models, and models of discrete data. Prerequisite: ESRM 6423 with a grade of C or better. (Typically offered: Spring)

ESRM 6533. Qualitative Research. 3 Hours.

Introduction of non-quantitative methods, including data collection through interviews, field observation, records research, internal and external validity problems in qualitative research. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall and Spring)

ESRM 6543. Advanced Qualitative Research. 3 Hours.

Preparation for the conduct of qualitative research, structuring, literature reviews, data collection and analysis, and reporting results. Prerequisite: ESRM 6533 with a grade of C or better. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

ESRM 6553. Advanced Multivariate Statistics. 3 Hours.

Builds on the foundation provided in Multivariate and introduces techniques that extend methodological elements of canonical, discriminant, factor analytic, and longitudinal analyses, providing the mathematical and theoretical foundations necessary for these designs. Prerequisite: ESRM 6453 with a grade of C or better. (Typically offered: Spring Even Years)

ESRM 6613. Evaluation of Policies, Programs, and Projects. 3 Hours.

Introduction to evaluation in social science research, including why and how evaluations of programs, projects, and policies are conducted; includes analysis of actual evaluations in a variety of disciplines. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)

This course is cross-listed with EDRE 6213.

ESRM 6653. Measurement and Evaluation. 3 Hours.

Fundamentals of measurement: scales, scores, norms, reliability, validity. Test and scale construction and item analysis. Standardized measures and program evaluation models in decision making. Prerequisite: ESRM 6403 with a grade of C or better. (Typically offered: Fall)

ESRM 668V. Practicum in Research. 1-6 Hour.

Practical experience in educational research on campus, in school systems, or in other agencies in educational program development. (Typically offered: Irregular)

ESRM 6753. Item Response Theory. 3 Hours.

Topics of measurement in the psychometric field focusing on item response theory; item level and test level analyses including differential item functioning, test dimensionality, computer adaptive testing, equating, and general evaluation and usage of measurement instruments. Prerequisite: ESRM 6653 with a grade of C or better. (Typically offered: Spring Odd Years)

ESRM 699V. Seminar. 1-6 Hour.

Seminar. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ESRM 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Educational Technology (ETEC) Courses

ETEC 5203. Foundations of Educational Technology. 3 Hours.

Provides learners with a comprehensive survey of the major trends, issues, people, processes, and products that have significantly affected the evolution of the field of educational technology. (Typically offered: Spring and Summer)

ETEC 5213. Designing Educational Media. 3 Hours.

Instruction in the design, development and implementation of various types of web based audio and visual media for enhancing instruction. Prerequisite: Graduate standing. (Typically offered: Fall)

ETEC 5243. Designing Technology Based Instruction: Theories and Models. 3 Hours.

The study and application of theories, models and methods for designing and developing instruction which utilizes technology tools and applications. Prerequisite: Graduate standing. (Typically offered: Fall)

ETEC 5263. Grant Writing in Educational Technology. 3 Hours.

Students will have an opportunity to find grant funding sources, write a grant, and submit an actual grant proposal to an agency for consideration. Will survey research in instructional media over the past 60 years and learn specific criteria for reading and evaluating research reports and articles. Will investigate current issues and topics related to research and grant writing in instructional media. (Typically offered: Summer)

ETEC 5303. Teaching with Technology in the K-12 Classroom. 3 Hours.

A study of learning theories and technologies that can be utilized to support and to enhance instruction in multiple subject areas in the K-12 classroom. Prerequisite: Graduate standing. (Typically offered: Spring)

ETEC 5313. Principles in Visual Literacy. 3 Hours.

Students gain understanding of visual literacy research and learn to create graphics that support learning. Literature in the area of visual literacy and learning theories as well as tools that facilitate effective visual literacy will be used to create visuals that are clear, communicate well, and help enhance learner performance. (Typically offered: Spring and Summer)

ETEC 5373. Designing Web Sites and ePortfolios. 3 Hours.

Students design websites for content delivery with a focus upon multiple platforms, effective design principles, accessibility, and copyright compliance. They will apply these concepts in the design of an ePortfolio showcasing skills as an educational technology practitioner. Prerequisite: Educational Technology Master of Education (ETECME) major, and course must be taken in the final semester of ETECME program. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

ETEC 5743. Internship. 3 Hours.

A supervised field placement in educational technology that provides experience consistent with the student's professional goals and training emphasis. Internship experiences are planning and directed under the guidance of a faculty member. On-campus and on-site supervision is required. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ETEC 5981. Eportfolio Production. 1 Hour.

This is a capstone course that is typically taken in the last semester of coursework and designed to: 1) review key constructs presented within the Educational Technology curriculum; 2) provide ETEC students the opportunity for reflection relative to his/her learning of the key concepts; and 3) utilize technology to assemble student-created artifacts that demonstrate mastery of the key concepts. (Typically offered: Fall and Spring)

ETEC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

EETEC 6223. Research and Strategic Planning in Educational Technology. 3 Hours.

The course provides an overview of quantitative, qualitative, mixed methods research and experiences intended to develop strategic planning knowledge, values, attitudes, and skills in the management and leadership in educational technology and instructional design programs. (Typically offered: Fall)

EETEC 6243. Advanced Instructional Design. 3 Hours.

This course explores advanced topics in instructional design to facilitate understanding of grounded models, advanced theories, and research. This course focuses on: 1) design and development of contextualized technology-supported learning environments; 2) analysis and application of advanced theoretical foundations of design; and 3) examination and critique of instructional design research. Prerequisite: ETEC 5243 or equivalent. (Typically offered: Spring)

EETEC 6253. Teaching and Learning at a Distance. 3 Hours.

An examination of methods and technologies for teaching instructional content at a distance. Emphasis is on techniques for the development, utilization and evaluation of technology integration for instruction in a variety of learning environments. (Typically offered: Spring and Summer)

EETEC 6393. Issues and Trends in Designing Instruction with Technology. 3 Hours.

Critical challenges posed as a result of the increasing infusion of technology into the school and training environments are explored. The course prepares students to make and defend policy decisions and become conversant with current trends and issues in the field. (Typically offered: Fall)

Electrical Engineering (ELEG) Courses

ELEG 5173L. Digital Signal Processing Laboratory. 3 Hours.

Use of DSP integrated circuits. Lectures, demonstrations, and projects. DSP IC architectures and instruction sets. Assembly language programming. Development tools. Implementation of elementary DSP operations, difference equations, transforms and filters. Prerequisite: ELEG 3124. (Typically offered: Irregular)

ELEG 5203. Semiconductor Devices. 3 Hours.

Crystal properties and growth of semiconductors, energy bands and charge carriers in semiconductors, excess carriers in semiconductors, analysis and design of p/n junctions, analysis and design of bipolar junction transistors, and analysis and design of field-effect transistors. Students may not receive credit for both ELEG 4203 and ELEG 5203. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5213. Integrated Circuit Fabrication Technology. 3 Hours.

Theory and techniques of integrated circuit fabrication technology; crystal growth, chemical vapor deposition, impurity diffusion, oxidation, ion implantation, photolithography and metallization. Design and analysis of device fabrication using SUPREM and SEDAN. In-process analysis techniques. Student review papers and presentations on state of the art fabrication and device technology. Prerequisite: ELEG 4203 or ELEG 5203. (Typically offered: Irregular)

ELEG 5223. Design and Fabrication of Solar Cells. 3 Hours.

Solar insolation and its spectral distribution/ p-n junction solar cells in dark and under illumination; solar cell parameters efficiency limits and losses; standard cell technology; energy accounting; design of silicon solar cells using simulation; fabrication of designed devices in the lab and their measurements. Students cannot receive credit for both ELEG 4223 and ELEG 5223. Prerequisite: ELEG 4203 or ELEG 5203. (Typically offered: Irregular)

ELEG 5243L. Microelectronic Fabrication Techniques and Procedures. 3 Hours.

The Thin-Film Fabrication course is designed to prepare students to use the thin-film equipment and processes available at the Engineering Research Center's thin-film cleanroom. The process modules to be trained on include lithography, metal deposition and etching, oxide deposition, growth and etching, reactive dry etching, tantalum anodization, photodefinable spin-on dielectric and electroplating. The related metrology modules include microscope inspection, spectrophotometric measurement of oxide, profilometry and four-point probe measurements. Prerequisite: ELEG 5273. (Typically offered: Irregular)

ELEG 5253L. Integrated Circuit Design Laboratory I. 3 Hours.

Design and layout of large scale digital integrated circuits. Students design, check, and simulate digital integrated circuits which will be fabricated and tested in I.C. Design Laboratory II. Topics include computer-aided design, more in-depth coverage of topics from ELEG 4233, and design of very large scale chips. Prerequisite: ELEG 4233 or ELEG 5923. (Typically offered: Irregular)
This course is cross-listed with CSCE 5253L.

ELEG 5273. Electronic Packaging. 3 Hours.

An introductory treatment of electronic packaging, from single chip to multichip, including materials, substrates, electrical design, thermal design, mechanical design, package modeling and simulation, and processing considerations. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5293L. Integrated Circuits Fabrication Laboratory. 3 Hours.

Experimental studies of silicon oxidation, solid-state diffusion, photolithographical materials and techniques, bonding and encapsulation. Fabrication and testing of PN diodes, NPN transistors and MOS transistors. Prerequisite: ELEG 5213. (Typically offered: Irregular)

ELEG 5303. Introduction to Nanomaterials and Devices. 3 Hours.

(Formerly ELEG 4303.) This course provides the students with an introduction to nanomaterials and devices. The students will be introduced to the quantization of energy levels in nanomaterials, growth of nanomaterials, electrical and optical properties, and devices based on these nanomaterials, such as tunneling resonant diodes, transistors, detector, and emitters. Graduate students will be given additional or different assignments. Graduate students will be expected to explore and demonstrate an understanding of the material with a greater level of depth and breadth than the undergraduates. Each group of students will have different expectations and grading systems. The instructor will prepare and distribute two distinct syllabi. Corequisite: ELEG 4203. Prerequisite: ELEG 3214 and PHYS 2074. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ELEG 5313. Power Semiconductor Devices. 3 Hours.

Carrier transport physics; breakdown phenomenon in semiconductor devices; power bipolar transistors, thyristors, power junction field-effect transistors, power field-controlled diodes, power metal-oxide-semiconductor field-effect transistors, and power MOS-bipolar devices. Prerequisite: ELEG 4203 or graduate standing. (Typically offered: Irregular)

ELEG 5323. Semiconductor Nanostructures I. 3 Hours.

This course is focused on the basic theoretical and experimental analyses of low dimensional systems encountered in semiconductor heterojunctions and nanostructures with the emphasis on device applications and innovations. Prerequisite: ELEG 4203 or instructor permission. (Typically offered: Irregular)

ELEG 5333. Semiconductor Nanostructures II. 3 Hours.

This course is a continuation of ELEG 5323 Semiconductors Nanostructures I. It is focused on the transport properties, growth, electrical and optical properties of semiconductor nanostructures, and optoelectronic devices. Prerequisite: ELEG 5323 or instructor permission. (Typically offered: Irregular)

ELEG 5343. Organic Electronics Technology. 3 Hours.

Students become familiar with recent developments in and process technology for organic material based devices and sensors in the classroom, but also gain hands on experience with fabrication processes using micro-fabrication tools in the lab. (Typically offered: Irregular)

ELEG 5353. Semiconductor Optoelectronic Devices. 3 Hours.

This course will provide graduate students a detailed background in semiconductor optoelectronic devices such as light emitting diodes and lasers, photodetectors, solar cells, modulators. The applications of these devices will also be discussed. Prerequisite: ELEG 4203 or ELEG 5203. (Typically offered: Spring Odd Years)

ELEG 5363. Semiconductor Material and Device Characterization. 3 Hours.

This course provides an overview of semiconductor characterization techniques in industry: Electrical measurements, Optical measurements, Electron and ion beam measurements, X-ray and probe measurements. Prerequisite: ELEG 4203 or ELEG 5203 and instructor consent. (Typically offered: Irregular)

ELEG 5383. Introduction of Integrated Photonics. 3 Hours.

This course is designed to provide junior and senior graduate students detailed knowledge of integrated photonics by using silicon photonics as an example. The course covers a cycle of design, fabrication, and testing of photonic devices by using analytic and numerical methods. The course will focus on designing an interferometer, which is widely used in communication and sensing applications. Students will be exposed to use the state-of-art design simulation tool, Lumerical, to design the photonic circuits and to evaluate the performances. In the course project, students will extend the design rules to design a set of components to be used for integrated microwave photonics based on Ge on Si, SiGeSn, or Si₃N₄ on sapphire platform. Prerequisite: ELEG 4203 and ELEG 5353. (Typically offered: Irregular)

ELEG 5393. Electronic Materials. 3 Hours.

This is a lecture course designed to provide a fundamental introduction to materials science. Upon this fundamental basis, we will survey many of the properties and materials relevant to modern electronics. This course will cover semiconductors, but only briefly. The focus will be on properties and materials not generally well covered in other electrical engineering courses from a materials perspective. This will include, but not be limited to metals, dielectrics, and magnetic and optical materials. Prerequisite: Graduate standing; A knowledge of quantum mechanics is helpful but not required. (Typically offered: Spring)

ELEG 5403. Control Systems. 3 Hours.

Mathematical modeling of dynamic systems, stability analysis, control systems architectures and sensor technologies. Time-domain and frequency-domain design of feedback control systems: lead, lag, PID compensators. Special topics on microprocessor implementation. Credit not given for both ELEG 4403 and ELEG 5403. Prerequisite: Graduate standing or ELEG 3124. (Typically offered: Irregular)

ELEG 5413. Modern Control Systems. 3 Hours.

A second course in linear control systems. Emphasis on multiple-input and multiple-output systems: State-space analysis, similarity transformations, eigenvalue and eigenvector decomposition, stability in the sense of Lyapunov, controllability and observability, pole placement, quadratic optimization. Credit not given for both ELEG 4413 and ELEG 5413. Prerequisite: ELEG 5403 or equivalent. (Typically offered: Irregular)

ELEG 5423. Optimal Control Systems. 3 Hours.

Basic concepts, conditions for optimality, the minimum principle, the Hamilton Jacobi equation, structure and properties of optimal systems. Prerequisite: ELEG 4403 or graduate standing. (Typically offered: Irregular)

ELEG 5443. Nonlinear Systems Analysis and Control. 3 Hours.

Second-order nonlinear systems. Nonlinear differential equations. Approximate analysis methods. Lyapunov and input-output stability. Design of controllers, observers, and estimators for nonlinear systems. Prerequisite: ELEG 4403 or graduate standing. (Typically offered: Irregular)

ELEG 5473. Power System Operation and Control. 3 Hours.

Study of the control and operation of electric power systems: Modeling, dynamics, and stability of three-phase power systems. Design and implementation of control systems related to generation and transmission. Overview of the related industry and government regulations for power system protection and reliability. Prerequisite: ELEG 4403 or graduate standing. (Typically offered: Irregular)

ELEG 5503. Design of Advanced Power Distribution Systems. 3 Hours.

Design considerations of electric power distribution systems, including distribution transformer usage, distribution system protection implementation, primary and secondary networks design, applications of advanced equipment based on power electronics, and use of capacitors and voltage regulation. Students may not receive credit for both ELEG 4503 and ELEG 5503. Prerequisite: ELEG 3304 or graduate standing. (Typically offered: Irregular)

ELEG 5513. Power Systems Analysis. 3 Hours.

Modeling and analysis of electric power systems: Energy sources and conversion; load flow analysis; reference frame transformations; symmetrical and unsymmetrical fault conditions; load forecasting and economic dispatch. Credit not given for both ELEG 4513 and ELEG 5513. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5523. Electric Power Quality. 3 Hours.

The theory and analysis of electric power quality for commercial, industrial and residential power systems. Specific topics include harmonics, voltage sags, wiring and grounding, instrumentation, distributed generation and power electronic systems, and site surveys. Case studies complement the theoretical concepts. Prerequisite: ELEG 3304 or graduate standing. (Typically offered: Irregular)

ELEG 5533. Power Electronics and Motor Drives. 3 Hours.

Fundamentals of power electronics, diode bridge rectifiers, inverters, general concepts on motor drives, induction motor drives, synchronous motor drives, and dc motor drives. Students may not receive credit for both ELEG 4533 and ELEG 5533. Prerequisite: Graduate standing or ELEG 3224 and ELEG 3304. (Typically offered: Irregular)

ELEG 5543. Introduction to Power Electronics. 3 Hours.

Presents basics of emerging areas in power electronics and a broad range of topics such as power switching devices, electric power conversion techniques and analysis, as well as their applications. Students may not receive credit for both ELEG 5543 and ELEG 4543. Prerequisite: ELEG 2114 and ELEG 3214, or graduate standing. (Typically offered: Irregular)

ELEG 5553. Switch Mode Power Conversion. 3 Hours.

Basic switching converter topologies, control scheme of switching converters, simulation of switching converters, resonant converters, isolated converters, dynamic analysis of switching converters. Students will not receive graduate credit for both ELEG 4553 and ELEG 5553. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5563. EMI in Power Electronics Converters: Generation, Propagation and Mitigation. 3 Hours.

Concepts of electro-magnetic-interference issues in power electronics converters. Basic concepts of EMI measurement, modeling and mitigation, with a focus on conducted EMI in power electronics converters. The course is structured with lectures and a lab session. Students can not receive credit for both ELEG 4563 and ELEG 5563. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5623. Information Theory. 3 Hours.

Continuous and discrete source and channel models, measure of information, channel capacity, noisy-channel coding theorem, coding and decoding techniques. Prerequisite: ELEG 3143 or ELEG 4623 or graduate standing. (Typically offered: Irregular)

ELEG 5633. Detection and Estimation. 3 Hours.

Binary and multiple decisions for single and multiple observations; sequential, composite, and non-parametric decision theory; estimation theory; sequential, non-linear, and state estimation; optimum receiver principles. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5663. Communication Theory. 3 Hours.

Principles of communications. Channels and digital modulation. Optimum receivers and algorithms in the AWGN and fading channels. Coherent, non-coherent detectors and matched filters. Bounds on the performance of communications, and comparison of communications systems. Background in stochastic processes and probabilities, communication systems is desirable. Students may not receive credit for both ELEG 4623 and ELEG 5663. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

ELEG 5693. Wireless Communications. 3 Hours.

Comprehensive course in fast developing field of wireless mobile/cellular personal telecommunications. Topics include cellular system structures, mobile radio propagation channels, etc. Prerequisite: Graduate standing. (Typically offered: Irregular)

ELEG 5703. RF & Microwave Design. 3 Hours.

An introduction to microwave design principles. Transmission lines, passive devices, networks, impedance matching, filters, dividers, and hybrids will be discussed in detail. Active microwave devices will also be introduced. In addition, the applications of this technology as it relates to radar and communications systems will be reviewed. Selected topics for device fabrication and measurements will be covered. Cannot get credit if student has taken ELEG 4703. Prerequisite: ELEG 3704. (Typically offered: Irregular)

ELEG 5723. Advanced Microwave Design. 3 Hours.

This course is an advanced course in microwave design building on the introduction to microwave design course. A detailed discussion of active devices, biasing networks, mixers, detectors, Microwave Monolithic Integrated Circuits (MMIC), and wideband matching networks will be provided. In addition, a number of advanced circuits will be analyzed. Prerequisite: ELEG 3704 and ELEG 4703 or ELEG 5703. (Typically offered: Irregular)

ELEG 5763. Advanced Electromagnetic Scattering & Transmission. 3 Hours.

Reflection and transmission of electromagnetic waves from a flat interface, the Poynting theorem, the complex and average power, the rectangular wave guides, TE and TM modes, radiation from antennas in free space and introduction to computational electromagnetics. Prerequisite: ELEG 3704. (Typically offered: Irregular)

ELEG 5773. Electronic Response of Biological Tissues. 3 Hours.

Understand the electric and magnetic response of biological tissues with particular reference to neural and cardiovascular systems. Passive and active forms of electric signals in cell communication. We will develop the central electrical mechanisms from the membrane channel to the organ, building on those that are common to many electrically active cells in the body. Analysis of Nernst equation, Goldman equation, linear cable theory, and Hodgkin-Huxley Model of action potential generation and propagation. High frequency response of tissues to microwave excitation, dielectric models for tissue behavior, Debye, Cole-Cole models. Role of bound and free water on tissue properties. Magnetic response of tissues. Experimental methods to measure tissue response. Applications to Electrocardiography & Electroencephalography, Microwave Medical Imaging, RF Ablation will be discussed. Students may not receive credit for both ELEG 4773 and ELEG 5773. Prerequisite: MATH 2584, ELEG 3704 or BIOL 2533 or equivalent. (Typically offered: Irregular)

ELEG 5783. Introduction to Antennas. 3 Hours.

Basic antenna types: small dipoles, half wave dipoles, image theory, monopoles, small loop antennas. Antenna arrays: array factor, uniformly excited equally spaced arrays, pattern multiplication principles, nonuniformly excited arrays, phased arrays. Use of MATLAB programming and mathematical techniques for antenna analysis and design. Emphasis will be on using simulation to visualize variety of antenna radiation patterns. Students cannot get credit for ELEG 5783 if they have taken ELEG 4783. Prerequisite: ELEG 3704. (Typically offered: Irregular)

ELEG 587V. Special Topics in Electrical Engineering. 1-3 Hour.

Consideration of current electrical engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

ELEG 588V. Special Problems. 1-6 Hour.

Opportunity for individual study of advanced subjects related to a graduate electrical engineering program to suit individual requirements. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ELEG 5903. Engineering Technical Writing. 3 Hours.

In this course, advanced graduate students (PhD candidates and selected MS students) will be trained in rephrasing and preparing technical papers, including scientific reports. Illustrations step by step will be explained. Each student is required to prepare technical papers based on their own research results and will be guided from selecting a title to a finished product. The emphasis will be placed on the structures of the articles including figures and table preparation, abstract writing, citations and references, and acknowledgments. The students will also be trained to prepare letters to the journals' editors and how to respond to reviewers' comments. Prerequisite: Graduate standing. (Typically offered: Fall)

ELEG 5914. Advanced Digital Design. 4 Hours.

To master advanced logic design concepts, including the design and testing of synchronous and asynchronous combinational and sequential circuits using state of the art CAD tools. Students may not receive credit for both ELEG 5914 and ELEG 4914 or CSCE 4914 and CSCE 5914. Corequisite: Lab component. Prerequisite: ELEG 2904 or CSCE 2114. (Typically offered: Irregular) This course is cross-listed with CSCE 5914.

ELEG 5923. Introduction to Integrated Circuit Design. 3 Hours.

Design and layout of large scale digital integrated circuits using CMOS technology. Topics include MOS devices and basic circuits, integrated circuit layout and fabrication, dynamic logic, circuit design, and layout strategies for large scale CMOS circuits. Students may not receive credit for both ELEG 4233 and ELEG 5923. Prerequisite: ELEG 3214 or ELEG 3933 and MATH 2584. (Typically offered: Fall)

ELEG 5953. Semiconductor Device and IC ESD Reliability. 3 Hours.

This course will cover semiconductor device and IC ESD design. The course is structured with lecture sessions and is offered to graduate students. The objective of this course is for students to understand semiconductor device and IC ESD design. Students will be able to demonstrate understanding of the basic concepts of ESD on-chip and off-chip protection for ICs and the future trends in ESD protections for advanced and emerging ICs. Prerequisite: ELEG 5923. (Typically offered: Irregular)

ELEG 5983. Computer Architecture. 3 Hours.

(Formerly ELEG 4983.) Design of a single board computer including basic computer organization, memory subsystem design, peripheral interfacing, DMA control, interrupt control, and bus organization. Prerequisite: ELEG 3924. (Typically offered: Irregular)

ELEG 5993. Mixed-signal Modeling and Simulation. 3 Hours.

Study of basic analog, digital & mixed signal simulation solution methods. Modeling with hardware description languages. Use of state-of-the-art simulators and HDLs. Students may not receive credit for both ELEG 4293 and ELEG 5993. Prerequisite: ELEG 3224 or graduate standing. (Typically offered: Irregular)

ELEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ELEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

English (ENGL) Courses

ENGL 5003. Composition Pedagogy. 3 Hours.

Introduction to teaching college composition. Designed for graduate assistants at the University of Arkansas. (Typically offered: Fall)

ENGL 5023. Writing Workshop: Fiction. 3 Hours.

Fiction writing workshop. Prerequisite: Creative Writing MFA students only. (Typically offered: Irregular) May be repeated for up to 24 hours of degree credit.

ENGL 5033. Writing Workshop: Poetry. 3 Hours.

Poetry writing workshop. Prerequisite: Creative Writing MFA students only. (Typically offered: Irregular) May be repeated for up to 24 hours of degree credit.

ENGL 5043. Translation Workshop. 3 Hours.

Problems of translation and the role of the translator as both scholar and creative writer; involves primarily the discussion in workshop of the translations of poetry, drama, and fiction done by the students, some emphasis upon comparative studies of existing translations of well-known works. Primary material will vary. Prerequisite: Reading knowledge of a foreign language and Creative Writing MFA students only. (Typically offered: Irregular) May be repeated for up to 24 hours of degree credit. This course is cross-listed with WLLC 504V.

ENGL 5063. English Language and Composition for Teachers. 3 Hours.

Subject matter and methods of approach for the teaching of composition in high school. (Typically offered: Fall and Spring)

ENGL 507V. Creative Non-Fiction Workshop. 1-3 Hour.

The theory and practice of the 'New Journalism' with a study of its antecedents and special attention to the use of 'fictional' techniques and narrator point of view to make more vivid the account of real people and real events. (Typically offered: Irregular)

ENGL 5083. Professional Topics. 3 Hours.

Specialized topics related to professional issues in the humanities, e.g. academic and alternative-academic job searches, publication workshops, public humanities, and/or teaching of humanities disciplines at various levels. (Typically offered: Irregular)

This course is cross-listed with HUMN 5083.

ENGL 5093. Research Methods in Rhetoric and Composition. 3 Hours.

Covers an array of research methods to support scholarly work in the fields of Rhetoric and Composition. Focus will vary depending on instructor interest. (Typically offered: Spring Even Years)

ENGL 510V. Readings in English and American Literature. 1-6 Hour.

Open to Honors candidates and graduate students. Prerequisite: Departmental approval and instructor approval required. (Typically offered: Irregular) May be repeated for degree credit.

ENGL 5173. Advanced Studies in Medieval Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5183. The Structure of Present English. 3 Hours.

Structural analysis of the language. (Typically offered: Spring)

ENGL 5193. Graduate Internship in English. 3 Hours.

Internship changes depending on availability and student interest. Departmental consent required. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENGL 5203. Introduction to Graduate Studies. 3 Hours.

Develop knowledge and strategies for successfully negotiating graduate work and the profession. Topics covered include, but are not limited to, scholarly habits and practices, writing and publishing skills, scholarly associations, journals, conferences, university structures, and career paths. Emphasis on the development of individual academic and professional goals. (Typically offered: Irregular)

ENGL 5213. Portfolio Workshop. 3 Hours.

Workshop designed for students in the M.A. Program in English who are using the Portfolio Option to complete the program. Instructor consent required. (Typically offered: Spring)

ENGL 5223. Advanced Studies in Renaissance Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5233. Craft of Translation: I. 3 Hours.

An examination of the principal challenges that confront translators of literature, including the recreation of style, dialect, ambiguities, and formal poetry; vertical translation; translation where multiple manuscripts exist; and the question of how literal a translation should be. (Typically offered: Irregular)

ENGL 5243. Special Topics. 3 Hours.

Designed to cover subject matter not offered in other courses. (Typically offered: Irregular) May be repeated for degree credit.

ENGL 5263. Craft of Fiction: I. 3 Hours.

Such aspects of the genre as scene, transition, character, and conflict. Discussion is limited to the novel. (Typically offered: Irregular)

ENGL 5273. Craft of Poetry: I. 3 Hours.

An examination of perception, diction, form, irony, resolution, and the critical theories of the major writers on poetry, such as Dryden, Coleridge, and Arnold. (Typically offered: Irregular)

ENGL 5283. Craft of Fiction: II. 3 Hours.

Second part of the study of the techniques of fiction. Discussion is limited to the short story. Prerequisite: ENGL 5263. (Typically offered: Irregular) May be repeated for degree credit.

ENGL 5293. Craft of Poetry: II. 3 Hours.

Second part of the study of the techniques of poetry; independent study of a poet or a problem in writing or criticism of poetry. (Typically offered: Irregular) May be repeated for up to 15 hours of degree credit.

ENGL 5313. Introduction to Literary Theory. 3 Hours.

An advanced introductory survey of a number of theoretical approaches to literature. (Typically offered: Irregular)

ENGL 5383. Histories of Rhetoric and Composition. 3 Hours.

Surveys contextualized histories of the field of Rhetoric and Composition. Focus and readings will vary depending on instructor interest. (Typically offered: Spring Even Years)

ENGL 5403. Advanced Studies in Nineteenth-Century British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5413. Advanced Studies in Modern and Contemporary British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5453. Technical Writing in Healthcare Settings. 3 Hours.

Focuses on the work of technical writing across a variety of healthcare settings. Prepares healthcare professionals and healthcare-adjacent professionals to use technical writing theory and skills in their workplace. (Typically offered: Summer)

ENGL 5463. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall) This course is cross-listed with WLLC 5463, ANTH 5473.

ENGL 5513. Document Design for Technical Writers. 3 Hours.

Focuses on the role of document design in technical and professional writing. Covers industry standard software and theories of rhetorically-centered document design. Special emphasis on creating print-ready technical documents such as manuals, catalogs, and infographics. (Typically offered: Fall Odd Years)

ENGL 5523. Technical Writing for Online Audiences. 3 Hours.

Investigates the medium-specific challenges of preparing technical documents for online audiences. Covers user-centered theory, strategies, and skills for online writing, HTML, CSS, and web standards. Specific focus on creating organizational websites with editorial workflows geared towards technical writers. (Typically offered: Fall Even Years)

ENGL 5533. Technical Writing Praxis. 3 Hours.

Focuses on the process of applying theory to situated practice in technical writing. The first portion of the course will lay out the fundamentals of technical writing theory, with the second half situating that theory within genre-specific practice. Second-half topics will vary by instructor interest and expertise. (Typically offered: Summer) May be repeated for up to 6 hours of degree credit.

ENGL 5543. Advanced Studies in U.S. Latino/Latina Literature and Culture. 3 Hours.

The study of works of U.S. Latino/a literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5563. Advanced Studies in Native American Literature and Culture. 3 Hours.

The study of works of Native American literature, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5583. Advanced Studies in Arab American Literature and Culture. 3 Hours.

The study of works of Arab American literature and criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. Research paper required. No knowledge of Arabic necessary. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5593. Advanced Studies in Gender, Sexuality, and Literature. 3 Hours.

The study of gender or sexuality and literature, with attention to specific theories, themes, genres, authors, historical moments, literary movements, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5623. The Bible as Literature. 3 Hours.

The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms. (Typically offered: Irregular) This course is cross-listed with WLIT 5623.

ENGL 5653. Shakespeare: Plays and Poems. 3 Hours.

An introduction to a broad selection of Shakespeare's work. (Typically offered: Irregular)

ENGL 5703. Advanced Studies in American Literature and Culture Before 1900. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5723. Advanced Studies in Literature and Culture of the American South. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5763. Advanced Studies in Postcolonial Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5803. Advanced Studies in Modern and Contemporary American Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5863. Advanced Studies in African American Literature and Culture. 3 Hours.

The study of works of African American literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5923. Advanced Studies in Film and Media. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5933. Advanced Studies in Popular Culture and Popular Genres. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5943. Advanced Studies in Criticism and Literary Theory. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5953. Advanced Studies in Literary History. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 5963. Advanced Studies in Technical Writing and Public Rhetorics. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. Course will cover various topics relevant to students working in Technical Writing and Public Rhetorics. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENGL 5973. Advanced Studies in Rhetoric and Composition. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6113. Seminar in Medieval Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6193. The Development of English. 3 Hours.

Intensive course in the fundamentals of linguistic study and their application to the history of English from prehistoric times to the present. (Typically offered: Fall)

ENGL 6203. Seminar in Renaissance Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6243. Seminar in Special Topics. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6443. Seminar in Nineteenth-Century British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6513. Seminar in Modern and Contemporary British Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6543. Seminar in U.S. Latino/Latina Literature and Culture. 3 Hours.

The study of works of U.S. Latino/a literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6553. Seminar in Native American Literature and Culture. 3 Hours.

The study of works of Native American literature, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6583. Seminar in Arab American Literature and Culture. 3 Hours.

The study of works of Arab American literature and criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. Research paper required. No knowledge of Arabic necessary. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6593. Seminar in Gender, Sexuality, and Literature. 3 Hours.

The study of gender or sexuality and literature, with attention to specific theories, themes, genres, authors, historical moments, literary movements, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6723. Seminar in American Literature and Culture Before 1900. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6733. Seminar in Literature and Culture of the American South. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6763. Seminar in Postcolonial Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6803. Seminar in Modern and Contemporary American Literature and Culture. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6853. Seminar in African American Literature and Culture. 3 Hours.

The study of works of African American literature and literary criticism, with attention to particular themes, genres, authors, literary movements, historical moments, or other organizing principles. Content varies. At least one major research paper, suitable for presentation or publication, will be required. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6923. Seminar in Film and Media. 3 Hours.

Extensive research into, and discussion of, a focused topic in film studies, with emphasis upon film as text. Extended project required. Course topic varies. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6933. Seminar in Popular Culture and Popular Genres. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6943. Seminar in Criticism and Literary Theory. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 6973. Seminar in Rhetoric and Composition. 3 Hours.

Subject matter changes depending on student interest and faculty expertise. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

ENGL 698V. Master's Thesis. 1-6 Hour.

Master's thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENGL 699V. Master of Fine Arts Thesis. 1-6 Hour.

Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENGL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Entomology (ENTO) Courses

ENTO 500V. Special Problems. 1-4 Hour.

Special problems. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

ENTO 5013. Morphology of Insects. 3 Hours.

Origin, evolution, and functional significance of external insect structure. Structure and function of major internal systems. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory 4 hours per week. Corequisite: Lab component. (Typically offered: Fall Odd Years)

ENTO 5024. Insect Diversity and Taxonomy. 4 Hours.

Principles and practices of insect classification and identification with emphasis on adult insects. 2.5 hours lecture, 4 hours lab. Prerequisite: ENTO 3013 or instructor consent. Corequisite: Lab component. (Typically offered: Fall) This course is cross-listed with BIOL 5024.

ENTO 5043. Apiculture. 3 Hours.

To acquaint the student with social insects in general and honey bees in particular, to promote an interest in apiculture as a hobby, occupation, and/or science, to give the students the basic knowledge of how to keep honey bees, and to increase awareness of the contribution that pollinating insects make to agriculture, natural ecosystems, and human life. Corequisite: Lab component. Prerequisite: Instructor consent. (Typically offered: Spring Odd Years)

ENTO 5053. Insect Ecology. 3 Hours.

To develop an understanding of important ecological concepts through study of dynamic relationships among insects and their environment. To become familiar with the literature of insect ecology, and interpretation and critique of ecological research. Previous knowledge of basic entomology and/or ecology will be assumed. 2 hours lecture/2 hours lab. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Fall Even Years) This course is cross-listed with BIOL 5053.

ENTO 510V. Special Topics. 1-3 Hour.

Topics not covered in other courses or a more intensive study of specific topics in entomology. (Typically offered: Irregular) May be repeated for degree credit.

ENTO 5113. Insect Behavior and Chemical Ecology. 3 Hours.

Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Prerequisite: Instructor consent. Corequisite: Lab component. (Typically offered: Spring Even Years)

This course is cross-listed with BIOL 5113.

ENTO 5123. Biological Control. 3 Hours.

Theoretical and practical basis for biological control of arthropod pests and weeds via parasites, predators, and pathogens. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. (Typically offered: Fall Odd Years)

ENTO 5133. Insect Molecular Genetics. 3 Hours.

A hands on course in insect molecular genetic techniques including molecular diagnostics and population genetics. Students will learn how to apply advanced molecular genetic methodologies and Internet database resources to insects that they are using for their graduate research. (Typically offered: Spring Even Years)

This course is cross-listed with BIOL 5133.

ENTO 5153. Insect Pest Management. 3 Hours.

Study of principles and concept of insect pest management. Areas covered include a survey of arthropod pests and damage, population dynamics, damage thresholds, physiological units, prediction models, surveillance, arthropod sampling, strategies and tactics utilized to maintain pest populations below economic injury levels.

Prerequisite: Instructor consent. (Typically offered: Spring Odd Years)

ENTO 5163. Advanced Applied Entomology. 3 Hours.

Topics will include the integration of tactics, integration of disciplines and specific case histories in insect management, or use of insects to manage weeds.

Prerequisite: Instructor consent. (Typically offered: Spring Even Years)

ENTO 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

ENTO 6071. Seminar. 1 Hour.

Fall: special topics not covered in regular course work. Spring: critical review of research papers in entomology. Seminar will be taken by graduate student majors for both semesters. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ENTO 6113. Insect Physiology and Molecular Biology. 3 Hours.

Overview of insect physiology and modern molecular techniques to study physiological processes. Previous knowledge of basic entomology is helpful, but not required. Two lectures per week (1 hour 20 minutes each). (Typically offered: Spring Even Years)

This course is cross-listed with BIOL 6113.

ENTO 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Environmental Dynamics (ENDY) Courses

ENDY 5043. GIS Analysis and Modeling. 3 Hours.

Unlike conventional GIS courses that focus on studying 'where', this course will teach students to address beyond 'where' using various GIS analysis and modeling techniques to explore 'why' and 'how'. The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. (Typically offered: Spring)

This course is cross-listed with GEOS 5653, ANTH 5653.

ENDY 5053. Quaternary Environments. 3 Hours.

An interdisciplinary study of the Quaternary Period including dating methods, deposits soils, climates, tectonics and human adaptations. (Typically offered: Fall)

This course is cross-listed with ANTH 5053, GEOS 5053.

ENDY 5113. Global Change. 3 Hours.

Examines the interacting natural and anthropogenic factors involved in global change, concentrating on climate variability and change. Prerequisite: Graduate standing or instructor's approval. (Typically offered: Spring)

This course is cross-listed with GEOS 5113.

ENDY 5153. Environmental Site Assessment. 3 Hours.

Principles, problems, and methods related to conducting an environmental site assessment. An applied course covering field site assessment, regulatory documentation, and report preparation. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Irregular)

This course is cross-listed with GEOS 5153.

ENDY 5853. Environmental Isotope Geochemistry. 3 Hours.

Introduction to principles of isotope fractionation and distribution in geological environments isotopic analytical methods, and extraction of isotope samples; application of isotopes in characterization of geologic processes and interaction with hydrologic, surficial, and biologic attenuation, paleothermometry soil and biochemical processes. (Typically offered: Spring)

This course is cross-listed with GEOS 5853.

ENDY 600V. ENDY Thesis Research. 1-6 Hour.

Master's Thesis. May be repeated for degree credit. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ENDY 6013. Environmental Dynamics. 3 Hours.

Required course for ENDY doctoral candidates. Overview of Earth Systems: Lithosphere; Hydrosphere, Atmosphere, Biosphere, Cryosphere, and human interaction across Earth systems. Emphasis on understanding of processes within Earth systems and interactions across Earth Systems as they pertain to global self-regulation, secular variation, climate stability, development and sustainability of human societies. Prerequisite: Graduate standing. (Typically offered: Fall)

ENDY 602V. Current Topics Seminar. 1-2 Hour.

Various aspects of the environment will be explored through topic specific seminars. Subject matter will change each semester addressing current environmental issues and research. Seminars will be one or two hours credit. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ENDY 6033. Society and Environment. 3 Hours.

This course examines the complex interrelationships between human societies and the natural environment. Drawing on diverse and interdisciplinary perspectives in archaeology, ethnography, history, geography, and palaeo-environmental studies, readings and discussion will explore the co-production of social and environmental systems over time. (Typically offered: Spring)

This course is cross-listed with ANTH 6033.

ENDY 689V. Special Problems in Environmental Dynamics. 1-6 Hour.

Independent study of a topic related to environmental dynamics under the guidance of an ENDY faculty member. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ENDY 6991. Environmental Dynamics Colloquium. 1 Hour.

Weekly meetings for discussion of current research in environmental dynamics. Graduate students must register for colloquium each semester. Colloquium credit does not count towards minimum hours required for the doctorate. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

ENDY 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Ethnomusicology (MUSY)

Courses

MUSY 5113. Proseminar: Ethnomusicology. 3 Hours.

An introduction to ethnomusicological study, with readings and discussion of seminal writings in the field and practical experience in ethnomusicological analysis and description. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MUSY 5323. Seminar: Topics in Asian and Middle Eastern Poetry and Music. 3 Hours.

Reading seminars on selected topics, such as Poetry and Music in Persian, Arabic and Turkish Cultures of the Islamic World; and Poetry and Song in Early East Asia. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Exercise Science (EXSC)

Courses

EXSC 5023. Advanced Teaching in Exercise Science. 3 Hours.

Examination and practical exposure to the principles and practices of undergraduate teaching in exercise science. Includes course planning, teaching techniques, assessment strategies, and supervised practice. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

EXSC 5323. Biomechanics I. 3 Hours.

Intended to serve as an introduction to biomechanics and focuses on scientific principles involved in understanding and analyzing human motion. (Typically offered: Fall)

EXSC 5333. Instrumentation in Biomechanics. 3 Hours.

The application of knowledge and skills necessary for data collection for sports analysis. Provides valuable information on instrumentation used specifically in biomechanics. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 5353. Exercise Psychology. 3 Hours.

Exercise Psychology is a lecture and discussion format for students interested in learning about theoretical and research information related to exercise adherence. (Typically offered: Fall)

EXSC 5443. Seminar in Brain Injury and Behavior. 3 Hours.

The Brain Injury and Behavior Seminar will immerse you in specific topics pertaining to the study of human brain-behavior relationships. Emphasis will be placed on traumatic brain injury (TBI), including moderate-to-severe injuries, as well as mild TBI or concussion. The first half of the course will focus on research related to how individuals sustain and recover from TBI. The second half of the course will focus on sports-related concussion in youth, collegiate, and professional athletes, with an emphasis on how athletes sustain concussions, how concussions are assessed, treated, and managed, and how return-to-play decision are made. This course will introduce you to research in a variety of fields that include physiology, neurology, and neuropsychology through primary source material in the form of book chapters and journal articles. (Typically offered: Irregular)

EXSC 5513. Physiology Exercise I. 3 Hours.

A study of the foundation literature in exercise physiology. Emphasis is placed on the muscular, cardiovascular, and respiratory systems. (Typically offered: Fall)

EXSC 5523. Muscle Metabolism in Exercise. 3 Hours.

A study of the metabolic changes that occur in muscle as a result of exercise, exercise training, and other stressors. Prerequisite: EXSC 5513 or equivalent. (Typically offered: Spring)

EXSC 5533. Cardiac Rehabilitation Program. 3 Hours.

An examination of the concepts, design, and implementation of cardiac rehabilitation programs. Emphasis on exercise programs but reference to nutrition, psychology, and other lifestyle interventions. (Typically offered: Spring Even Years)

EXSC 5543. Cardiovascular Function in Exercise. 3 Hours.

Study of the effects of exercise training and other stressors on the cardiovascular system. Detailed study of the components of the cardiovascular system and the responses and adaptations of those components to selected stimuli. Corequisite: EXSC 5513 or equivalent. (Typically offered: Fall Even Years)

EXSC 5593. Practicum in Laboratory Instrumentation. 3 Hours.

Practical experience in testing physical fitness utilizing laboratory equipment. Objective is to quantify physiological parameters, leading to the individualized exercise prescription. (Typically offered: Fall and Summer)

EXSC 5613. Physical Dimensions of Aging. 3 Hours.

This course will focus on the physiological changes with healthy aging, pathophysiology of age-related diseases, testing issues, exercise interventions, and the psychosocial aspects of aging. Prerequisite: EXSC 5513. (Typically offered: Spring Odd Years)

EXSC 5643. Advanced Psychology of Sports Injury and Rehabilitation. 3 Hours.

The purpose of this course is to explore and discuss factors related to the psychological aspects of athletic injuries. These factors include the sociocultural, mental, emotional, and physical dimensions of injury rehabilitation. (Typically offered: Spring)

EXSC 5773. Performance and Drugs. 3 Hours.

The pharmacological and physiological effects of ergogenic aids upon the athlete and performance coupled with the ethical and moralistic viewpoints of drug taking. Practical laboratory experiences are provided with pertinent statistical surveys of athletes; their drug taking habits and relevant psychological impact on performance. (Typically offered: Spring)

EXSC 6313. Muscle Physiology. 3 Hours.

To expand the student's knowledge of the skeletal muscle form and function. Specifically, how muscle is formed to how it can adapt as a post-mitotic tissue. This course will focus on the morphological, physiological, cellular, and molecular factors that affect skeletal muscle form and function. (Typically offered: Fall Even Years)

EXSC 6323. Biomechanics II. 3 Hours.

Analysis of human movement with emphasis on sports skills by application of principles of anatomy, kinesiology, and cinematographical analysis. Prerequisite: EXSC 5323. (Typically offered: Irregular)

EXSC 6343. Physiology of Exercise II. 3 Hours.

Detailed study of the body systems affected by exercise, the functions of these systems during exercise, the effects of age, sex, body type, and nutrition on capacity for exercise, the techniques of assessing work capacity, and a critical analysis of research literature in this area. (Typically offered: Irregular)

EXSC 6443. Thermoregulation and Fluid Balance. 3 Hours.

Comprehensive overview of human thermoregulatory responses to exercise in heat and cold. (Typically offered: Spring Even Years)

Extension Education (EXED)

Courses

EXED 5183. Management of Volunteer Programs. 3 Hours.

(Formerly EXED 4183.) Recruiting, training, management, evaluation, and recognition of volunteers in agricultural-related agencies, non-profit organizations, community groups, and advisory committees. Graduate degree credit will not be given for both EXED 4183 and EXED 5183. (Typically offered: Irregular)

Finance (FINN)

Courses

FINN 510V. Special Topics in Finance. 1-3 Hour.

This course focuses on advanced energy risk management strategies and tactics commonly applied by regional, national, and multi-national energy firms, including upstream, midstream, and downstream oil and gas companies, and by firms and other participants in the electricity industry. Contemporary issues related to energy, fracking, conflict, technological innovation, and the future of the energy industry will be covered. Topics include financial statement analysis and valuation of energy companies, commodity trading and risk management, forwards, futures, options, and swaps, and hedging. Fundamental credit risk analysis and risk exposure, counterparty risk, risk mitigation techniques, and country risk are also covered. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

FINN 5113. Corporate Financial Management. 3 Hours.

Financial analysis, planning and control; decision making and modeling for financial managers; and financial policies for management. (Typically offered: Spring)

FINN 5133. Advanced Investments. 3 Hours.

(Formerly FINN 4133.) Sound training in the principles of security analysis and portfolio management and certain advanced techniques of financial management. Modern portfolio theory and its application to portfolio management practices will be emphasized. Graduate degree credit will not be given for both FINN 4133 and FINN 5133. Prerequisite: FINN 3063. (Typically offered: Fall and Spring)

FINN 5173. Energy Finance and Risk Management. 3 Hours.

This course provides an advanced introduction to energy finance, defined as the application of finance principles to energy, energy service, and related industries, concerning all aspects of the energy value chain. Topics include: (1) physical fossil fuel markets; (2) physical electricity markets; (3) financially traded energy products; and (4) credit, counterpart, country, and enterprise risk. It also introduces students to business valuation and investment banking applications in the energy industry vertical. Prerequisite: FINN 5113 or FINN 5223. (Typically offered: Fall)

FINN 5223. Financial Markets & Valuation. 3 Hours.

Analysis of financial information by capital markets in the determination of security values with specific applications to retail and logistics companies. This course views these and other companies from the point of view of the capital markets. (Typically offered: Spring) May be repeated for degree credit.

FINN 5233. Advanced Corporate Finance. 3 Hours.

(Formerly FINN 4233.) Addresses complex and multifaceted issues and problems in financial decision-making. Graduate degree credit will not be given for both FINN 4233 and FINN 5233. Prerequisite: FINN 3603. (Typically offered: Irregular)

FINN 5303. Advanced Corporate Financial Management. 3 Hours.

Focus on financial policy issues using real situational cases. Topics include cost of capital, capital budgeting and long-term planning, value-based management, real options, as well as project financing and valuation. Prerequisite: FINN 5223. (Typically offered: Irregular)

FINN 5313. Advanced Commercial Banking. 3 Hours.

This course focuses on advanced risk management strategies commonly implemented at regional and large commercial banks. Topics include financial statement analysis of banks and holding companies, credit analysis of global cash flow, Basel III capital requirements and stress testing, interest rate risk measurement and management, and interest rate hedging with derivatives. (Typically offered: Fall and Spring)

FINN 5333. Investment Theory and Management. 3 Hours.

Integration of theory, practice of investments with solution of individual and institutional portfolio management problems; Institute of Chartered Financial Analysts' Problems; variable annuity in estate planning. Prerequisite: FINN 5223. (Typically offered: Fall)

FINN 541V. Shollmier Investment Project. 1-3 Hour.

Provide students with the opportunity to design and apply complex investment strategies used in institutional portfolio management on the Shollmier MBA Fund that can involve fixed income and equity securities as well as derivatives. Students will use top down asset allocation models, bottom up security selection, and hedge fund strategies. Prerequisite: FINN 5223 and FINN 5333. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

FINN 5433. Real Estate Finance and Investment. 3 Hours.

(Formerly FINN 4433.) Consideration of professional aspects of the real estate field. Emphasis is placed upon finance techniques and investment analysis. The focus is on commercial real estate. Brokerage, property management, appraisal, property development and current problems are also addressed. Students prepare a feasibility study on a commercial development project. Graduate degree credit will not be given for both FINN 4433 and FINN 5433. Prerequisite: FINN 3933. (Typically offered: Spring)

FINN 550V. Independent Study. 1-3 Hour.

(Formerly FINN 450V.) Permits students on an individual basis to explore selected topics in finance, with the consent of instructor. Graduate degree credit will not be given for both FINN 450V and FINN 550V. (Typically offered: Irregular)

FINN 6043. Finance Theory. 3 Hours.

Provides a conceptual understanding of key theoretical developments in the field of financial economics, including firm decisions under risk within a world of uncertainty. (Typically offered: Irregular)

FINN 6133. Seminar in Investment Theory. 3 Hours.

Study advanced literature in field investments, with special reference to theory of random walks, stock valuation models, portfolio management. (Typically offered: Spring)

FINN 6233. Seminar in Financial Management. 3 Hours.

Financial management of firm with emphasis on financial theory or firm, quantitative methods used in financial analysis, planning. (Typically offered: Irregular)

FINN 6333. Empirical Research in Finance. 3 Hours.

A study of recent empirically based research in finance. (Typically offered: Irregular)

FINN 6733. Seminar in Financial Markets and Institutions. 3 Hours.

Recent developments in the literature of financial markets and institutions. Participants will be involved in the extensive study of existing theories and empirical tests of the theories. (Typically offered: Irregular)

FINN 683V. Contemporary Issues in Doctoral Colloquium. 1-3 Hour.

To explore and evaluate contemporary research issues in finance. Course content to reflect the most recent developments in theory and empirical research methodologies. Prerequisite: Doctoral student status and instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

FINN 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Food Science (FDSC)

Courses

FDSC 5001. Seminar. 1 Hour.

Presentation and discussion of graduate student research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 2 hours of degree credit.

FDSC 509V. Special Problems Research. 1-6 Hour.

Original investigation on assigned problems in food science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

FDSC 5111L. Food Analysis Lab. 1 Hour.

(Formerly FDSC 4111L.) Laboratory exercises providing students with experience of analytical techniques and instrumentation used in food analysis. Laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 4111L and FDSC 5111L. Corequisite: FDSC 4113 or FDSC 5113 (formerly FDSC 4113). Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304) and CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L). (Typically offered: Spring)

FDSC 5113. Food Analysis. 3 Hours.

(Formerly FDSC 4113.) Methods of analysis, instrumentation, and laboratory techniques for measuring the chemical composition of raw and value-added products. Lecture 3 hours. Graduate degree credit will not be given for both FDSC 4113 and FDSC 5113. Corequisite: FDSC 4111L or FDSC 5111L (formerly FDSC 4111L). Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304) and CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L). (Typically offered: Spring)

FDSC 5121L. Food Microbiology Lab. 1 Hour.

(Formerly FDSC 4121L.) A hands-on laboratory course designed to teach students microbiological techniques and certain enumeration and plating techniques of specific food spoilage and pathogenic bacteria. Graduate degree credit will not be given for both FDSC 4121L and FDSC 5121L. Pre- or Corequisite: FDSC 4122 or FDSC 5122 (formerly FDSC 4122). (Typically offered: Fall)

FDSC 5122. Food Microbiology. 2 Hours.

(Formerly FDSC 4122.) The study of food microbiology including classification/taxonomy, contamination, preservation and spoilage of different kinds of foods, pathogenic microorganisms, food poisoning, sanitation, control and inspection and beneficial uses of microorganisms. Graduate degree credit will not be given for both FDSC 4122 and FDSC 5122. Prerequisite: BIOL 2013 and BIOL 2011L or BIOL 2533. (Typically offered: Fall)

FDSC 5223. Food Biosecurity. 3 Hours.

This course is the study of the security of agricultural products and the protection of our food supply from intentional and accidental, domestic and international contamination. Prerequisite: Graduate standing. (Typically offered: Irregular)

FDSC 5304. Food Chemistry. 4 Hours.

(Formerly FDSC 4304.) Water, carbohydrates, lipids, proteins, vitamins, and minerals in foods; biochemical and functional properties, enzymes, food additives (emulsifiers, pigments, colors, flavors, preservatives, and sweeteners) and texture as related to properties in food systems and during processing. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 4304 and FDSC 5304. Corequisite: Lab component. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L or (CHEM 3603 and CHEM 3601L). (Typically offered: Fall)

FDSC 531V. Internship in Food Science. 1-4 Hour.

(Formerly FDSC 431V.) The Food Science Internship is a supervised practical work experience with a food industry, research program or governmental agency to gain professional experience and insight into career opportunities. Graduate degree credit will not be given for both FDSC 431V and FDSC 531V. Prerequisite: Completion of first year of graduate studies and instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

FDSC 5413. Sensory Evaluation of Food. 3 Hours.

(Formerly FDSC 4413.) Principles and procedures for sensory evaluation of food. Appropriate uses of specific tests are discussed, along with physiological, psychological, and environmental factors affecting sensory verdicts. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both FDSC 4413 and FDSC 5413. Corequisite: Lab component. Prerequisite: STAT 2303 or WCOB 1033 or AGST 5023 or STAT 2823 or PSYC 2013. (Typically offered: Fall)

FDSC 5423. Foodborne Diseases. 3 Hours.

This course will introduce students to the major pathogens associated with foodborne diseases, their epidemiology, and approaches to outbreak investigation and control of foodborne illness. An emphasis will be placed on understanding the relationships between the host, the etiologic agent, and the environment as they relate to disease causation. The student will gain knowledge through lectures, case studies, readings, and an individual project. An understanding of basic biology principles is expected for this course. (Typically offered: Summer Odd Years)

FDSC 5503. Safety and Sanitation for the Food Industry. 3 Hours.

This web-based course will provide an appreciation of the need for sanitation in food processing and increase the students' knowledge of sanitary techniques. Topics will include contamination sources, plant and equipment design, cleaners and sanitizers, HACCP, and food biosecurity. Also covered will be considerations in selecting, establishing and maintaining a sanitation program. An understanding of general microbiology and chemistry principles is expected for this course. (Typically offered: Irregular)

FDSC 5713. Product Innovation for the Food Scientist. 3 Hours.

(Formerly FDSC 4713.) This is a capstone course integrating knowledge developed in Food Science to the development of new food products. This course will take an integrated multidisciplinary approach to developing innovative food products and will provide learning experiences in new product development and Research & Development. Topics include product formulation, ingredient interactions, sensory analysis, packaging, labeling, food safety and food law. Graduate degree credit will not be given for both FDSC 4713 and FDSC 5713. Corequisite: Lab component. Pre- or Corequisite: FDSC 4113 or FDSC 5113 (formerly FDSC 4113) and FDSC 4111L or FDSC 5111L (formerly FDSC 4111L). Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304), FDSC 3103, and FDSC 4413 or FDSC 5413 (formerly FDSC 4413). (Typically offered: Spring)

FDSC 5754. Engineering Principles of Food Processing. 4 Hours.

(Formerly FDSC 4754.) Basic mechanics of refrigeration, temperature controls, materials handling and mechanical problems as applied to foods and food processing. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 4754 and FDSC 5754. Corequisite: Lab component. Prerequisite: MATH 1213, PHYS 2013, and PHYS 2011L. (Typically offered: Spring Even Years)

FDSC 5823. Principles of Food Microbiology. 3 Hours.

This web-based course is a study of the fundamentals of food microbiology to include its history, classifications, spores and their importance, and the most common and serious pathogenic food microorganisms. Fermentation, spoilage microorganisms and control methodology are also discussed. (Typically offered: Irregular)

FDSC 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with AGED 5993, HORT 5993.

FDSC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

FDSC 602V. Special Topics. 1-3 Hour.

Discussions focused on selected topics of particular fields of raw product physiology and food processing. chemistry, physiology, microbiology, evaluation, sensory analysis and preservation. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

FDSC 6033. Food Biochemistry. 3 Hours.

Biochemical characteristics, functions, regulation and impact of components in raw and processed foods of plant origin. Lecture/discussion 3 hours per week. Prerequisite: CHEM 3813. (Typically offered: Fall Odd Years)

FDSC 6123. Food Carbohydrate Chemistry. 3 Hours.

Focus is on carbohydrate chemistry including molecular structures and physical properties, production and food applications, analytical methods for food carbohydrates, and interactions among food polysaccharides. Prerequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304). (Typically offered: Fall Even Years)

FDSC 6143. Advanced Food Processing and Packaging and their Environmental Impact. 3 Hours.

The course is directed to graduate students in food science and related fields. Students will learn advanced food processing technologies and packaging as well as the environmental issues associated to food production, processing, and distribution. An understanding of basic food processing/food engineering principles and knowledge of food processing operations is expected for this course. (Typically offered: Spring Even Years)

FDSC 6323. Nutraceuticals and Functional Foods. 3 Hours.

Course will include past, present and future of nutraceuticals and functional foods, chemistry, mechanism, novel technologies, nutrigenomics, processing, healthy lifestyle, regulation, safety, marketing, international aspects, and industry project. Prerequisite: CHEM 2613 (or CHEM 3603) and CHEM 3813 and FDSC 4304 or instructor consent. (Typically offered: Spring Even Years)

FDSC 6333. Food Protein Chemistry and Functionality. 3 Hours.

This course is a study in advanced food protein chemistry, including molecular structures, characterization, physicochemical bases of food protein functionality, structure-function relationship, processing technologies to improve functionality, as well as hands-on experiences with timely, practical projects related to food proteins. Lecture and problem solving projects for 3 hours per week. Pre- or Corequisite: FDSC 4304 or FDSC 5304 (formerly FDSC 4304). (Typically offered: Spring Odd Years)

FDSC 6403. Epidemiologic Principles in Food Safety and Public Health. 3 Hours.

This course will provide an introduction to epidemiologic methods used in foodborne disease outbreak investigations. The importance of surveillance systems in detecting outbreaks and in the development of effective disease prevention and control strategies will also be presented. An emphasis will be placed on understanding the relationships between the host, the etiologic agent, and the environment as they relate to disease causation. In addition, molecular methods utilized for the identification of etiologic agents will be discussed. Selected important foodborne diseases will be discussed in detail to clarify the role of epidemiology in understanding the pathogenesis of infectious processes in individuals and communities. Prerequisite: FDSC 4122 or FDSC 5122 (formerly FDSC 4122) or equivalent. (Typically offered: Fall Even Years)

FDSC 6443. Metabolism of Xenobiotics. 3 Hours.

This course is designed to provide in-depth knowledge of the integration of molecular, cellular, and physiologic aspects of xenobiotics (e.g. phytochemicals)/ micronutrients and metabolism. This course will also discuss the current understanding of the mechanism and regulation of gene expression by xenobiotics/ micronutrients. Examination of current research literature to understand how xenobiotics/micronutrients and physiological states metabolize and influence gene expression, as well as the research methodology used to address these relations. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

FDSC 6603. Chemosensory Perception and Measurement. 3 Hours.

This course is designed to address advanced techniques and current issues in sensory and consumer sciences, with a focus on chemosensory perception. This course consists of two main modules: I) anatomy and physiology of the chemosensory senses and II) measurement/analysis of chemosensory responses. This course includes both individual and group projects with an emphasis of four aspects of 'C': 'Concept,' 'Creativity,' 'Critical thinking skills,' and 'Communication.' Prerequisite: FDSC 4413 or FDSC 5413. (Typically offered: Fall Odd Years)

FDSC 700V. Doctoral Dissertation. 1-18 Hour.

The doctoral program in food science is an interdepartmental program offered by the departments of Food Science, Animal and Poultry Sciences, and Human Environmental Sciences. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

French (FREN) Courses

FREN 5003. French Grammar and Phonetics. 3 Hours.

Systematic review of principles of French grammar and syntax; comprehensive presentation of French phonetics. (Typically offered: Irregular)

FREN 5033. Advanced French Conversation. 3 Hours.

This course will provide a small discussion environment in which graduate students will improve their command of spoken French in an interactive setting. Discussion will concentrate on current cultural issues in the French speaking world. (Typically offered: Irregular)

FREN 5333. Old French Literature. 3 Hours.

An intensive study of French Medieval Literature from the Chansons de Geste to Villon, including an in-depth analysis of the genres and their evolution, and of the major authors of the times. (Typically offered: Irregular)

FREN 5353. Survey of French Poetry. 3 Hours.

A comprehensive study of French poetry from the Middle Ages to the twentieth century, focusing on close readings of individual poems. This course will cover literary movements and trends of the periods and presents the terminology required to do explication de texte. (Typically offered: Irregular)

FREN 5433. French 16th-Century Literature. 3 Hours.

A survey of representative writers of the sixteenth century. (Typically offered: Irregular)

FREN 5543. French 17th-Century Literature. 3 Hours.

A survey of representative writers of the seventeenth century. (Typically offered: Irregular)

FREN 5673. French 18th-Century Literature. 3 Hours.

French 18th-Century literature. (Typically offered: Irregular)

FREN 5703. Special Topics. 3 Hours.

May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

FREN 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

FREN 5773. Survey of Francophone Literature. 3 Hours.

A survey of representative texts in the field of sub-Saharan and North African literature concentrating on postcolonial novels using contemporary critical approaches. (Typically offered: Irregular)

FREN 5783. The French Nineteenth-Century Novel. 3 Hours.

The French Nineteenth-Century novel. (Typically offered: Irregular)

FREN 5833. French 20th-Century Novel. 3 Hours.

French 20th-Century novel. (Typically offered: Irregular)

General Engineering (GNEG) Courses

GNEG 5103. Globalization and Innovation. 3 Hours.

Integration of engineering in the globalized business environment. Innovation and integration models. Global survival skills. International organizational value-chain. Conducting business with emerging nations. Case studies; field trips; guest lectures. Experiential learning design component. Taken by students participating in departmental approved study abroad programs. (Typically offered: Irregular)

GNEG 550V. Master's Research Project. 1-3 Hour.

Required course for MSE students who wish to complete a Master's research project as part of their degree program. Prerequisite: Instructor permission. (Typically offered: Irregular)

GNEG 5801. Parallel Cooperative Education. 1 Hour.

Part time supervised experience in industry where students apply focused, discipline specific, classroom and research skills to problems directly related to their area of study in a professional work place setting. May be repeated for up to 3 hours of non-degree credit. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

GNEG 5811. Alternating Cooperative Education. 1 Hour.

Full time supervised experience in industry where students apply focused, discipline specific, classroom and research skills to problems directly related to their area of study in a professional work place setting. May be repeated for up to 3 hours of non-degree credit. Prerequisite: Instructor permission. (Typically offered: Fall, Spring and Summer)

GNEG 590V. Special Topics. 1-4 Hour.

Consideration of current engineering topics not covered in other courses. Prerequisite: Instructor's consent. (Typically offered: Irregular) May be repeated for up to 16 hours of degree credit.

Geosciences (GEOS) Courses

GEOS 5003. Seminar in Geography. 3 Hours.

Selected topics, the nature of which varies with the need. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

GEOS 5011. Colloquium. 1 Hour.

Weekly meetings of faculty, graduates, advanced students and guests to discuss research and trends in the field of geography. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

GEOS 5023. Technical and Proposal Writing for the Geosciences. 3 Hours.

Preparation of technical reports, research proposals, and manuscripts for publication in the area of geosciences. (Typically offered: Spring)

GEOS 5043. Foundations of Geospatial Data Analysis. 3 Hours.

Basic mathematical tools applied in geospatial technology, including trigonometry in mapping, linear algebra in remote sensing, optimization in spatial decision support, and graph theory in routing. Course develops the framework for spatial data analysis and decision support. Pre- or Corequisite: GEOS 5543. (Typically offered: Fall and Spring)

GEOS 5053. Quaternary Environments. 3 Hours.

An interdisciplinary study of the Quaternary Period, including dating methods, deposits, soils, climates, tectonics, and human adaptation. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with ANTH 5053, ENDY 5053.

GEOS 5073. Geospatial Technologies Computational Toolkit. 3 Hours.

Basic computational tools and processes applied in geospatial software, related computer hardware components, systems and applications software, and spatial database fundamentals. Python, including SciPy and NumPy, geospatial implementations will be emphasized. No programming experience is required. Pre- or Corequisite: GEOS 5543. (Typically offered: Fall and Spring)

GEOS 5083. Geospatial Data Mining. 3 Hours.

Basic tools for analyzing, summarizing and visualizing geospatial data. Exploratory data and spatial data analysis, probability distributions and application, single and multivariate analysis and hypothesis testing, and spatial smoothing and interpolation. Emphasis will be on problem solving in geospatial settings using the R statistical language. Prerequisite: GEOS 5043 and GEOS 5073 or equivalent. (Typically offered: Fall and Spring)

GEOS 5093. History and Philosophy of Geography. 3 Hours.

This course familiarizes students with the history of geography, the contributions of geographers to scientific thought and theory, and research techniques that are used in geography. Emphasis is given to the integration of statistical and spatial analysis, and their applications in field research. The course includes short field-based projects in and around Northwest Arkansas. (Typically offered: Spring Even Years)

GEOS 510V. Special Problems in Physical Geosciences. 1-6 Hour.

Special problems in Geosciences. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

GEOS 5113. Global Change. 3 Hours.

Examines central issues of global change including natural and human induced climate change, air pollution, deforestation, desertification, wetland loss urbanization, and the biodiversity crisis. The U.S. Global Change Research Program is also examined. (Typically offered: Fall)

This course is cross-listed with ENDY 5113.

GEOS 5123. Stratigraphic Principles and Practice. 3 Hours.

Physical and biological characteristics of sedimentary environments and their correlation in time with emphasis on the local geologic section. Corequisite: Lab component. Prerequisite: GEOS 4223 or GEOS 5323 (formerly GEOS 4223). (Typically offered: Irregular)

GEOS 5133. Radar Remote Sensing. 3 Hours.

Introduction to radar remote sensing and its applications in geology, geography, archeology, engineering, and agriculture. Focuses on Synthetic Aperture Radar (SAR) and advanced techniques including radar stereo, polarimetry, and interferometry. Covers Interferometric SAR (InSAR) for mapping topography and modeling Earth's surface motions due to earthquakes, volcanic eruptions, landslides, and subsidence. Prerequisite: GEOS 3023 or equivalent. (Typically offered: Spring)

GEOS 5143. 3D Seismic Exploration. 3 Hours.

(Formerly GEOS 4463.) Interpretation of 3D seismic data for geological structure, stratigraphy, and pore fluid variations with emphasis on hydrocarbon exploration. Credit will not be given for both GEOS 4463 and GEOS 5143. Prerequisite: GEOS 4433 or GEOS 5433 (formerly GEOS 4433). (Typically offered: Spring)

GEOS 5153. Environmental Site Assessment. 3 Hours.

Principles, problems, and methods related to conducting an environmental site assessment. An applied course covering field site assessment, regulatory documentation, and report preparation. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Irregular)

This course is cross-listed with ENDY 5153.

GEOS 5163. Hydrogeologic Modeling. 3 Hours.

Topics include numerical simulation of ground water flow, solute transport, aqueous geochemistry, theoretical development of equations, hypothesis testing of conceptual models, limitations of specific methods, and error analysis. Emphasis on practical applications and problem solving. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033) and computer literacy. (Typically offered: Irregular)

GEOS 5173. Urban Geography. 3 Hours.

(Formerly GEOS 4073.) Areal patterns of modern urban regions and the focus shaping these patterns. Emphasis is placed on American urban areas and their evolution and functional areas. Field work. Graduate degree credit will not be given for both GEOS 4073 and GEOS 5173. (Typically offered: Irregular)

GEOS 5183. Geography of the Middle East. 3 Hours.

(Formerly GEOS 4043.) Physical and cultural landscapes, natural and cultural resources, art and architecture, land use, political history, OPEC, and current problems of North Africa and the Middle East region west of Afghanistan are discussed. Class participation, discussions, slides and films, and student presentations will round out the class. Graduate degree credit will not be given for both GEOS 4043 and GEOS 5183. (Typically offered: Fall)

GEOS 5196. Advanced Field Methods of Applied Hydrogeology. 6 Hours.

Applied field course emphasizing collection and interpretation of ground water data. Three hours may be applied toward an M.S. degree in geology. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Summer)

GEOS 520V. Special Problems in Human Geography. 1-6 Hour.

Special problems in human geography. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

GEOS 5213. Principles of Remote Sensing. 3 Hours.

Fundamental concepts of remote sensing of the environment. Optical, infrared, microwave, LIDAR, and in situ sensor systems are introduced. Remote sensing of vegetation, water, urban landscapes, soils, minerals, and geomorphology is discussed. The course includes laboratory exercises in GIS software and field spectroscopy. (Typically offered: Fall)

GEOS 5223. Sedimentary Petrology. 3 Hours.

Sediments and sedimentary rocks. Lecture 2 hours, laboratory 2 hours per week. Corequisite: Lab component. Prerequisite: GEOS 4223 or GEOS 5323 (formerly GEOS 4223). (Typically offered: Fall)

GEOS 5233. Geography of Religion & Sacrality. 3 Hours.

Explores the spatial nature of the World's major faiths and religious institutions, focusing on the distribution and origins of these religions. Examines the religious beliefs, rituals, architecture, demographics, and art in different societies, cultures, and countries. Considers the tenets and practices of what is sacred and/or spiritual, held in common by a group or community. Prerequisite: Graduate standing. (Typically offered: Irregular)

GEOS 5243. Political Geography. 3 Hours.

(Formerly GEOS 4243.) Contemporary world political problems in their geographic context. Development of the principles of political geography with emphasis upon the problems of Eastern Europe, Africa, and Southeast Asia. Graduate degree credit will not be given for both GEOS 4243 and GEOS 5243. (Typically offered: Fall Odd Years)

GEOS 5253. Geomorphology. 3 Hours.

(Formerly GEOS 4053.) Mechanics of landform development. Lecture 2 hours, laboratory 3 hours per week. Several local field trips are required during the semester. Graduate degree credit will not be given for both GEOS 4053 and GEOS 5253. (Typically offered: Spring)

GEOS 5263. Hydrogeology. 3 Hours.

(Formerly GEOS 4033.) Occurrence, movement, and interaction of water with geologic and cultural features. Lecture 3 hours per week. Graduate degree credit will not be given for both GEOS 4033 and GEOS 5263. Corequisite: Lab component. Prerequisite: MATH 2043 or MATH 2554, and GEOS 3514. (Typically offered: Spring)

GEOS 5273. Principles of Geochemistry. 3 Hours.

(Formerly GEOS 4063.) Introduction to fundamental principles of geochemistry from historic development to modern concepts. Graduate degree credit will not be given for both GEOS 4063 and GEOS 5273. Corequisite: Lab component. Prerequisite: CHEM 1121L, CHEM 1123 and GEOS 2313. (Typically offered: Fall)

GEOS 5283. Economic Geology. 3 Hours.

(Formerly GEOS 4083.) Introduction to mineral deposits used as economic resources. Covers basic geology and geochemistry of mineral deposit formations and the formation of major classes of deposits. Examines the relationship between the distribution of ores, oil, gas, coal, and Plate Tectonics. Explores environmental issues associated with the extraction of earth resources. Graduate degree credit will not be given for both GEOS 4083 and GEOS 5283. Prerequisite: GEOS 2313. (Typically offered: Irregular)

GEOS 5293. Introduction to Global Positioning Systems and Global Navigation Satellite Systems. 3 Hours.

(Formerly GEOS 4593.) Fundamentals of navigation, mapping, and high-precision positioning using the Navstar Global Positioning System. Topics include datum definition and transformation, map projections, autonomous and differential positioning using both code and carrier processing, and analysis of errors. Graduate degree credit will not be given for both GEOS 4593 and GEOS 5293. (Typically offered: Fall)

This course is cross-listed with ANTH 5593.

GEOS 530V. Special Problems in Regional Geography. 1-6 Hour.

Special problems in regional geography. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

GEOS 5313. Planetary Atmospheres. 3 Hours.

Origins of planetary atmospheres, structures of atmospheres, climate evolution, dynamics of atmospheres, levels in the atmosphere, the upper atmosphere, escape of atmospheres, comparative planetology of atmospheres. (Typically offered: Irregular)

GEOS 5323. Stratigraphy and Sedimentation. 3 Hours.

(Formerly GEOS 4223.) Introductory investigation of stratigraphic and sedimentologic factors important to the study of sedimentary rocks. Lecture 2 hours, laboratory 3 hours per week. A required weekend, two-day field trip will be conducted during the semester. Graduate degree credit will not be given for both GEOS 4223 and GEOS 5323. Corequisite: Lab component. Prerequisite: GEOS 3413. (Typically offered: Fall)

GEOS 534V. Internship in Physical Geography. 3-6 Hour.

(Formerly GEOS 430V.) Supervised experience in municipal, county, state or private natural resource management agency, or any other such organization approved by instructor. Graduate degree credit will not be given for both GEOS 430V and GEOS 534V. (Typically offered: Fall, Spring and Summer)

GEOS 5353. Meteorology. 3 Hours.

(Formerly GEOS 4353.) Examination of the atmospheric processes that result in multifarious weather systems. Offered as physical science. Graduate degree credit will not be given for both GEOS 4353 and GEOS 5353. (Typically offered: Fall)

GEOS 5363. Climatology. 3 Hours.

(Formerly GEOS 4363.) Fundamentals of topical climatology followed by a study of regional climatology. Offered as physical science. Graduate degree credit will not be given for both GEOS 4363 and GEOS 5363. (Typically offered: Spring)

GEOS 537V. Geology Field Trip. 1-2 Hour.

(Formerly GEOS 437V.) Camping field trip to areas of geologic interest, usually conducted during Spring Break. Graduate degree credit will not be given for both GEOS 437V and GEOS 537V. Prerequisite: GEOS 3313. (Typically offered: Spring) May be repeated for up to 4 hours of degree credit.

GEOS 5383. Hazard & Disaster Assessment, Mitigation, Risk & Policy. 3 Hours.

(Formerly GEOS 4383.) Comprehensive introduction to interdisciplinary approaches to natural and environmental hazards and risk. Hazards and disaster assessment, mitigation, and policy are the focus of the class. Graduate degree credit will not be given for both GEOS 4383 and GEOS 5383. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

GEOS 5393. Mathematical Modeling of Geological Processes. 3 Hours.

This course explores a variety of topics in applied mathematics and computational methods within the context of studying geological processes and from the perspective of a modeling practitioner. Programming is conducted in Python. Knowledge of Calculus II is necessary. (Typically offered: Irregular)

GEOS 5403. American Public Lands and Policy. 3 Hours.

The course examines the role of American federal public lands in 19th-21st century geography, history, policy, and art. It investigates the growth of conservation, preservation, and management movements in the US by looking at America's national parks, forests, dams, wildlife refuges, wilderness areas, managed and agricultural lands. Prerequisite: Graduate standing. (Typically offered: Irregular)

GEOS 5423. Remote Sensing of Natural Resources. 3 Hours.

Introductory digital image processing of remotely sensed data. Topics include data collection, laboratory design, scientific visualization, radiometric and geometric correction, enhancement, pattern recognition, artificial intelligence, and change detection in natural resource remote sensing. GIS-based exercises and a course project are included. Prerequisite: GEOS 3213 or GEOS 5213. (Typically offered: Spring Even Years)

GEOS 5433. Geophysics. 3 Hours.

(Formerly GEOS 4433.) Derivation from physical principles, of the geophysical methods for mapping the Earth. Computational methods of converting gravity, magnetic, radiometric, electrical, and seismic data into geologic information. Lecture 3 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both GEOS 4433 and GEOS 5433. Corequisite: Lab component. Prerequisite: MATH 2564 and PHYS 2033 and PHYS 2031L and GEOS 3514. (Typically offered: Irregular)

GEOS 5443. The Solid Earth. 3 Hours.

Modern views for the origin of the solid Earth and its structure, composition, and evolution through geologic time. Topics will include examination of relevant geophysical and geochemical constraints used to develop global models for the Earth. Prerequisite: GEOS 3313, MATH 2564, CHEM 1123, PHYS 2074 or instructor consent. (Typically offered: Irregular)

GEOS 5453. Introduction to Raster GIS. 3 Hours.

(Formerly GEOS 4553.) Theory, data structure, algorithms, and techniques behind raster-based geographical information systems. Through laboratory exercises and lectures multidisciplinary applications are examined in database creation, remotely sensed data handling, elevation models, and resource models using boolean, map algebra, and other methods. Graduate degree credit will not be given for both GEOS 4553 and GEOS 5453. (Typically offered: Fall)
This course is cross-listed with ANTH 5553.

GEOS 5473. Applied Climatology. 3 Hours.

Applied climatology involves the use of climatic data to solve a variety of social, economic and environmental problems, such as for clients in agriculture, water and energy management. The basic purpose of applied climatology is to help society, at all scales and levels, to achieve a better adjustment to the climatic environment. (Typically offered: Fall)

GEOS 5483. Severe Weather. 3 Hours.

(Formerly GEOS 4483.) Focuses on the formation and impact of weather phenomena such as blizzards, floods, tornadoes, thunderstorms, hurricanes and droughts. Covers the mechanisms and physics that control severe weather, advanced terminology, physical concepts and scientific methods used in meteorology, and the analysis and interpretation of meteorological data. Graduate degree credit will not be given for both GEOS 4483 and GEOS 5483. (Typically offered: Spring)

GEOS 550V. Internship in GIS & Cartography. 3-6 Hour.

(Formerly GEOS 440V.) Supervised experience in GIS and/or cartographic applications with municipal, county, state, or private enterprises. Graduate degree credit will not be given for both GEOS 440V and GEOS 550V. (Typically offered: Spring and Summer) May be repeated for up to 6 hours of degree credit.

GEOS 5513. Introduction to GIS Programming. 3 Hours.

This course introduces fundamentals of GIS software engineering and offers hands-on tutorials in customized applications using Arc GIS through programming ArcObjects in VBA/VA.net environment. Topics covered include ArcObjects, different programming syntax and styles, and fundamental routines and functions in ArcGIS. After completing the course, students will have the capability develop customized ArcGIS applications. (Typically offered: Fall)

GEOS 5523. Cartographic Design & Production. 3 Hours.

(Formerly GEOS 4523.) This course addresses advanced cartographic concepts (i.e. visual hierarchy, aesthetics, image cognition) and production techniques as they relate to computer-assisted mapping. Students produce a variety of maps using Adobe Illustrator (CS 4-6) software to build a map portfolio. Field trips may be required. Graduate degree credit will not be given for both GEOS 4523 and GEOS 5523. (Typically offered: Spring)

GEOS 5533. Introduction to Petroleum Geophysics. 3 Hours.

(Formerly GEOS 4533.) Introduction to seismic wave propagation and petroleum seismology with particular emphasis on seismic events, elastic waves, and seismic survey design. Credit will not be given for both GEOS 4533 and GEOS 5533. Prerequisite: MATH 2564, PHYS 2033, and GEOS 3514 or consent of instructor. (Typically offered: Fall)

GEOS 5543. Geospatial Applications and Information Science. 3 Hours.

An introduction to the methods and theory underlying the full range of geographic information science and collateral areas - including GNSS, remote sensing, cadastral, spatial demographics and others. (Typically offered: Fall and Spring)

GEOS 5553. Spatial Analysis Using ArcGIS. 3 Hours.

Applications of analysis of spatial data using ArcGIS tools in map design, on-line mapping, creating geodatabases, accessing geospatial data, geo-processing, digitizing, geocoding, spatial analysis including basic spatial statistics, analysis of spatial distributions and patterning and 3D application using ArcGIS 3D Analyst. Prerequisite: GEOS 3543 or GEOS 5543. (Typically offered: Fall and Spring)

GEOS 5563. Tectonics. 3 Hours.

Development of ramifications of the plate tectonics theory. Analysis of the evolution of mountain belts. Lecture 3 hours per week. Prerequisite: GEOS 3514. (Typically offered: Fall)

GEOS 5573. Advanced Cartographic Techniques & Production. 3 Hours.

Covers advanced production and techniques in cartography, including animation, geospatial visualization, pochade, and advanced visualization. Emphasizes client relationships in creating and producing cartographic materials. Corequisite: Lab component. Prerequisite: GEOS 4523 or GEOS 5523. (Typically offered: Irregular)

GEOS 5583. Enterprise and Multiuser GIS. 3 Hours.

GIS practice that is typical of collaborative team-based geospatial organizations. Solve real-world problems through end-to-end GIS design and implementation using ArcGIS Enterprise, extensive federal, state, and local repositories, and high quality software documentation. Includes relevant training in geospatial provenance and metadata, and in enterprise and multiuser GIS administration. Introductory-level familiarity with GIS is recommended. (Typically offered: Spring)

GEOS 5593. Introduction to Geodatabases. 3 Hours.

Fundamental concepts and applications of geospatial databases. Schema development and spatial data models for geodata. Spatial and attribute query and optimization, properties and structures of relational and object-oriented geodatabases. Spatial extensions of SQL, spatial indexing, measurement, and geometry. Course will use PostGIS, ESRI File Geodatabases, and MS-SQL. Prerequisite: GEOS 3543 and GEOS 3103 or equivalent. (Typically offered: Fall and Spring)

GEOS 560V. Graduate Special Problems. 2-6 Hour.

Library, laboratory, or field research in different phases of geology. (Typically offered: Fall, Spring and Summer) May be repeated for up to 4 hours of degree credit.

GEOS 5612. Research Methods in Geosciences. 2 Hours.

Survey of research methodologies used in both geology and geography, with an emphasis on quantitative analysis. Preparation of research proposals and presentations in the field of geosciences. Prerequisite: Graduate standing. (Typically offered: Fall)

GEOS 5653. GIS Analysis and Modeling. 3 Hours.

(Formerly GEOS 4653.) Unlike conventional GIS courses that focus on studying 'where', this course will teach students to address beyond 'where' using various GIS analysis and modeling techniques to explore 'why' and 'how'. The course will provide theoretical and methodological reviews of the principles of cartographic modeling and multi-criteria decision-making. Graduate degree credit will not be given for both GEOS 4653 and GEOS 5653. (Typically offered: Spring)
This course is cross-listed with ANTH 5653, ENDY 5043.

GEOS 5663. Low-Temperature Geochemistry of Natural Waters. 3 Hours.

(Formerly GEOS 4663.) Covers the low-temperature geochemistry of waters and their associated minerals at Earth's surface. Examines the controls on the chemical composition of natural waters and the minerals precipitated from them. Topics covered will include water-rock interactions, pH, redox, the carbonate-water system, clay minerals and exchange, heavy metals, and a brief introduction to stable isotopes and geomicrobiology. Credit will not be given for both GEOS 4663 and GEOS 5663. Prerequisite: CHEM 1121L, CHEM 1123, GEOS 1113, and GEOS 1111L. (Typically offered: Fall)

GEOS 5673. Volcanology. 3 Hours.

A broad introduction to volcanic processes and their associated hazards. Emphasis will be placed on applying basic physical and chemical principles to understanding volcanic systems. Prerequisite: GEOS 2313. (Typically offered: Irregular)

GEOS 5693. Environmental Justice. 3 Hours.

(Formerly GEOS 4693.) This course deals with the ethical, environmental, legal, economic, and social implications of society's treatment of the poor, the disenfranchised, and minorities who live in the less desirable, deteriorating neighborhoods, communities, and niches of our country. The class integrates science with philosophy, politics, economics, policy, and law, drawing on award-winning films, current news, and case studies. Credit will not be given for both GEOS 4693 and GEOS 5693. (Typically offered: Spring)

GEOS 5713. Geology of Our National Parks. 3 Hours.

(Formerly GEOS 4563.) This course examines the underlying geology responsible for selected parks, and explores the interplay of geology, biology, climate, topography, and humans to evaluate the value of the parks, and to anticipate the problems they will face in the near and long-term. Credit will not be given for both GEOS 4563 and GEOS 5713. Prerequisite: GEOS 1113. (Typically offered: Fall)

GEOS 5743. Petroleum Geology. 3 Hours.

(Formerly GEOS 4253.) Distribution and origin of petroleum. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both GEOS 4253 and GEOS 5743. Corequisite: Lab component. Prerequisite: Admission to the Geology graduate program. (Typically offered: Fall)

GEOS 5753. Karst Hydrogeology. 3 Hours.

(Formerly GEOS 4153.) Assessment of ground water resources in carbonate rock terrains; relation of ground water and surface water hydrology to karst; quantification of extreme variability in karst environments; data collection rationale. Field trips required. Graduate degree credit will not be given for both GEOS 4153 and GEOS 5753. Prerequisite: GEOS 4033 or GEOS 5263 (formerly GEOS 4033). (Typically offered: Irregular)

GEOS 5783. Geography of Europe. 3 Hours.

(Formerly GEOS 4783.) Geographic regions of the area with emphasis on their present development. Graduate degree credit will not be given for both GEOS 4783 and GEOS 5783. (Typically offered: Irregular)

GEOS 5793. Geospatial Unmanned Aircraft Systems. 3 Hours.

Geospatial unmanned aircraft systems (UAS) are becoming key technologies in a number of disciplines. This course will introduce safe and legal operation of UAS in aerial photography, multispectral, thermal and LIDAR applications, geodetic control, photogrammetric and computer vision processing, and the creation of accurate 2D and 3D digital information products. Pre- or Corequisite: GEOS 3213 or GEOS 5213 (formerly GEOS 4413) and (GEOS 4593 or GEOS 5293 (formerly GEOS 4593)) or equivalent. (Typically offered: Fall)

GEOS 5853. Environmental Isotope Geochemistry. 3 Hours.

Introduction to principles of isotope fractionation and distribution in geologic environments, isotopic analytical methods, and extraction of isotope samples; application of isotopes in characterization of geologic processes and interaction with hydrologic, surficial, and biologic attenuation, paleothermometry soil, and biogeochemical processes. (Typically offered: Spring) May be repeated for up to 3 hours of degree credit.
This course is cross-listed with ENDY 5853.

GEOS 5863. Quantitative Techniques in Geosciences. 3 Hours.

(Formerly GEOS 4863.) An introduction to the application of standard quantitative and spatial statistical techniques to geoscientific analysis. Students will use both micro and large system computers in the course. Graduate degree credit will not be given for both GEOS 4863 and GEOS 5863. (Typically offered: Spring)
This course is cross-listed with ANTH 5863.

GEOS 5873. Geological Data Analysis. 3 Hours.

(Formerly GEOS 4873.) Quantitative methods and techniques for analysis and interpretation of geological data. Credit will not be given for both GEOS 4873 and GEOS 5873. Corequisite: Lab component. Prerequisite: MATH 2564 and GEOS 3514. (Typically offered: Spring)

GEOS 5893. Geography of Religion & Sacrality. 3 Hours.

Examines how the geographic and climatic environments shape and influence religious tradition. Considers the location of worship centers in a community and the world, as well as the geography within them. Studies the relationship between communal and sacred spaces. Explores religious pilgrimages and how migration affects religious practice. (Typically offered: Irregular)

GEOS 5924. Earth System History (ACTS Equivalency = PHSC 1104). 4 Hours. (Formerly GEOS 4924.) Physical and biological events that form the history of the earth from its formation to the beginning of the historical era. Credit will not be given for both GEOS 4924 and GEOS 5924. Graduate enrollment only with departmental permission. Corequisite: Lab component. Prerequisite: GEOS 3514. (Typically offered: Spring)

GEOS 5933. Ancient Forest Science and Sustainability. 3 Hours. Ancient forests preserve beautiful habitat with high ecological integrity. This course will examine the development, spatial distribution, and ongoing destruction of ancient forests worldwide, and how science can contribute to the understanding and sustainable management of these valuable resources. (Typically offered: Spring)

GEOS 5973. Seminar in Geoinformatics. 3 Hours. Geographic information science and technology research topics of particular interest to the graduate student class. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

GEOS 5993. Dynamics of Sediment Transport. 3 Hours. The course will give aspiring geologists and civil engineers tools for solving sedimentological problems in their fields. Starting from a grounding in fluid mechanics, we will learn how sediment is transported and stratigraphy accumulated. This will be applied to problems in sedimentology at all scales. (Typically offered: Fall Odd Years)

GEOS 600V. Master's Thesis. 1-6 Hour. Master's thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

GEOS 700V. Doctoral Dissertation. 1-9 Hour. Dissertation research. Prerequisite: Graduate standing and Ph.D. candidacy (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

German (GERM) Courses

GERM 5013. Germany and the Holocaust: The Significance of the Holocaust in Differentiated Contexts. 3 Hours. (Formerly GERM 4013.) Taught in English. Topics covering the role of the Holocaust in German history, culture, art, language and German Studies. Equal emphasis will be placed on historical competence and philosophical/theoretical inquiry, addressed from a variety of media and primary and secondary sources. Graduate degree credit will not be given for both GERM 4013 and GERM 5013. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

GERM 5043. German Cinema. 3 Hours. (Formerly GERM 4043.) Presents a range of German films in cultural-historical context; vocabulary and structures for discussing film, film history, and film theory in German. Graduate degree credit will not be given for both GERM 4043 and GERM 5043. Prerequisite: GERM 3003. (Typically offered: Irregular)

GERM 5123. The German Novella. 3 Hours. An intensive study of the novella as a genre from its origin to the present. Prerequisite: GERM 3013. (Typically offered: Irregular)

GERM 5133. The German Drama. 3 Hours. A study of the development of the forms and themes of the German drama from the middle ages to the present. Prerequisite: GERM 3013. (Typically offered: Irregular)

GERM 5143. German Lyric Poetry. 3 Hours. A study of the forms and themes of German lyric poetry from the middle ages to the present. (Typically offered: Irregular)

GERM 5223. Early German Literature: Middle Ages to the Enlightenment. 3 Hours. Early German literature. (Typically offered: Irregular)

GERM 5273. German Literature: Enlightenment, Storm and Stress, and Classicism. 3 Hours. German literature. (Typically offered: Irregular)

GERM 5343. Early Modern German Literature: Late 19th and Early 20th Century. 3 Hours. Early modern German literature. (Typically offered: Irregular)

GERM 5363. German Literature after 1945. 3 Hours. German literature after 1945. (Typically offered: Irregular)

GERM 5703. Special Topics. 3 Hours. May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Graduate Education Courses (GRSD) Courses

GRSD 5003. The Professoriate: Teaching, Learning and Assessment. 3 Hours. Designed to introduce the future academic professional to the expectations of the faculty teaching role in higher education. Topics include techniques of effective teaching and learning, dealing with a variety of institutional expectations, course management issues, and using models of effective teaching across a broad spectrum of class sizes and levels. (Typically offered: Spring)

GRSD 5013. Practicum for Future Faculty. 3 Hours. This course is designed to follow GRSD 5003 and to give participants opportunities to apply theories and methods learned in that course. To accomplish these goals, the course instructor helps the participant arrange a mentoring opportunity as part of this course. Prerequisite: GRSD 5003. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

GRSD 5033. The Professoriate: Research and Service. 3 Hours. Designed to complement GRSD 5003 by focusing on topics of interest to future academic professionals beyond those related to instruction. Topics include developing a research statement, strategies for securing an academic position the general nature of employment and service expectations in higher education, research ethics, and funding issues, including grant proposal writing. (Typically offered: Fall)

GRSD 5041. Graduate Enrollment. 1 Hour. This course allows a degree-seeking graduate student to continue as an active graduate student. Students should enroll in this course only when they are not enrolled in credit-bearing academic courses. This course cannot be counted for degree credit. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Greek (GREK) Courses

GREK 5003. Greek Lyric Poetry. 3 Hours. (Formerly GREK 4003.) Readings from selected Greek lyric poems, to be chosen from several appropriate authors from the 7th through the 5th centuries BCE: Archilochus, Hipponax, Sappho, Alcaeus, Tyrtaeus, Mimnermus, Semonides, Solon, Xenophanes, Theognis, Pindar, Bacchylides. Graduate degree credit will not be given for both GREK 4003 and GREK 5003. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5013. Greek Epic Poetry. 3 Hours. (Formerly GREK 4013.) Study of the primary works of Greek hexameter poetry, including Homer, Hesiod, and/or the Homeric Hymns, with special attention to issues of oral composition and performance. Graduate degree credit will not be given for both GREK 4013 and GREK 5013. Prerequisite: GREK 2013. (Typically offered: Irregular)

GREK 5023. Greek Philosophy. 3 Hours.

(Formerly GREK 4023.) Study of representative works of Greek philosophy, including those of the Pre-Socratics, Plato, and/or Aristotle. Graduate degree credit will not be given for both GREK 4023 and GREK 5023. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5033. Herodotus or Thucydides. 3 Hours.

(Formerly GREK 4033.) Readings of Herodotus, Book VII, and Thucydides, Book VI; collateral readings on the Persian and Peloponnesian Wars. Graduate degree credit will not be given for both GREK 4033 and GREK 5033. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5043. Greek Drama. 3 Hours.

(Formerly GREK 4043.) Readings of two tragedies and one comedy; a study of the Greek theatre. Graduate degree credit will not be given for both GREK 4043 and GREK 5043. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5053. Greek Syntax and Composition. 3 Hours.

(Formerly GREK 4053.) Greek syntax and composition. Graduate degree credit will not be given for both GREK 4053 and GREK 5053. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5063. Hellenistic Poetry. 3 Hours.

(Formerly GREK 4063.) Selections from significant post-classical authors, including Callimachus, Theocritus, Bion, Moschus, Herondas, Apollonios of Rhodes, and/or poets of the Greek Anthology. Special attention to archaic and classical influences, contemporary Hellenistic culture, and Roman responses. Graduate degree credit will not be given for both GREK 4063 and GREK 5063. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5073. Ancient Greek Novel. 3 Hours.

(Formerly GREK 4073.) Study of the development of the Greek novel including the works of Lucian, Longus, Heliodorus, and/or Achilles Tatius. Graduate degree credit will not be given for both GREK 4073 and GREK 5073. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5083. Greek Epigraphy. 3 Hours.

(Formerly GREK 4083.) Study of inscriptions, especially Attic, in their historical and social contexts, from the 8th century BCE to the Hellenistic/Roman period. Training in epigraphical conventions and symbols. Graduate degree credit will not be given for both GREK 4083 and GREK 5083. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5093. Biblical and Patristic Greek. 3 Hours.

(Formerly GREK 4093.) Selected readings from appropriate texts, varying by semester, including the Septuagint, New Testament, Apostolic Fathers, and other patristic literature to the 5th century CE. Reading and discussion of selected texts in major genres. Graduate degree credit will not be given for both GREK 4093 and GREK 5093. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 5103. Greek Oratory. 3 Hours.

(Formerly GREK 4103.) Readings from selected speeches, to be chosen from one or more appropriate authors: Lysias, Antiphon, Demosthenes, Isocrates, Andocides. Study of sophism and rhetoric of Athens in the 5th and 4th centuries BCE. Graduate degree credit will not be given for both GREK 4103 and GREK 5103. Prerequisite: GREK 2013 or equivalent. (Typically offered: Irregular)

GREK 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

Health, Human Performance and Recreation (HHPR) Courses

HHPR 5353. Research in Health, Human Performance and Recreation. 3 Hours.

Methods and techniques of research in health, human performance and recreation including an analysis of examples of their use and practice in their application to problems of interest to the student. (Typically offered: Fall, Spring and Summer)

HHPR 6233. Management in HHPR. 3 Hours.

Deals with principles, procedures, relationships, problems, and current practices in the supervision of health education and kinesiology. Includes management of facilities, programs, personnel, and processes. (Typically offered: Irregular)

HHPR 6333. Measurement in HHPR. 3 Hours.

Competencies for analysis and application of evaluation and measurement in HHPR. (Typically offered: Fall Odd Years)

HHPR 689V. Directed Research. 1-6 Hour.

Laboratory investigations, in basic and applied research. (Typically offered: Fall, Spring and Summer)

HHPR 699V. Seminar. 1-3 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HHPR 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Higher Education (HIED) Courses

HIED 5003. Overview-American Higher Education. 3 Hours.

A basic course in the study of higher education open to all students seeking careers in colleges and universities. Serves as an introduction to the programs, problems, issues, and trends in higher education. (Typically offered: Fall)

HIED 5033. Student Affairs in Higher Education. 3 Hours.

Study of origins, functions, and policies in student personnel services in contemporary 2- and 4-year colleges and universities with emphasis on the student and student development. (Typically offered: Fall)

HIED 5043. Student Development in Higher Education. 3 Hours.

Provides those who work or plan to work in post secondary educational institutions with an understanding of the student population in contemporary colleges and universities. (Typically offered: Spring)

HIED 504V. Practicum in Higher Education. 1-6 Hour.

Students are assigned to a department or agency within or outside the university for professional experience under the joint supervision of on-site personnel and university faculty. Periodic meetings are scheduled for evaluation, discussion, and examination of techniques. (Typically offered: Fall, Spring and Summer)

HIED 5053. The Community College. 3 Hours.

An overview of the community college. Topics include the history and philosophy of the community college movement, students, curriculum, state and local campus governance, teaching, student personnel work, finance and issues, problems, and trends. (Typically offered: Irregular)

HIED 5063. Diversity in Higher Education. 3 Hours.

Broadly explores how sociocultural contexts influence diversity at colleges and universities. Focuses on the responsibilities of higher education leaders to be multiculturally competent professionals who foster inclusive practices for diverse student populations. (Typically offered: Irregular)

HIED 5073. Management of Higher Education Institutions. 3 Hours.

Principles and concepts of management and their application in college and university settings. (Typically offered: Fall and Summer)

HIED 5083. History and Philosophy of Higher Education. 3 Hours.

An examination of the history and development of higher education including the study of the philosophy, objectives, and functions of various types of institutions. (Typically offered: Spring)

HIED 5093. Research in Higher Education and Student Affairs. 3 Hours.

This course provides master's students an overview of research and literature applicable to the discipline; teaches students how to understand academic literature and use empirical evidence to inform practices and policies at colleges and universities. Prerequisite: MEd students in the Higher Education Program. (Typically offered: Fall, Spring and Summer)

HIED 5103. Higher Education in International Contexts. 3 Hours.

Explores various systems of higher education around the world. Equips students with the knowledge and skills to work in the increasingly internationalized field of higher education. (Typically offered: Irregular)

HIED 5303. Non-Profit Fundraising. 3 Hours.

Non-Profit Fundraising examines the theory and practice of the professional field of fundraising and development, which is dedicated to attracting philanthropic support from constituents for colleges, universities, health organizations, hospitals, non-profit organizations, museums and other philanthropic endeavors. (Typically offered: Irregular)

HIED 5643. Reflective Practice in Higher Education and Student Affairs. 3 Hours.

Provides students an opportunity to work in a functional area of higher education, reflect on how their experiences inform their career goals as higher education professionals, and learn job search strategies in higher education. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HIED 574V. Internship. 1-3 Hour.

Supervised field experiences in student personnel services, college administration, academic advising, institutional research, development, or other areas of college and university work. (Typically offered: Fall, Spring and Summer)

HIED 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIED 6013. The Professoriate: Problems and Issues. 3 Hours.

An examination of the vital issues and trends affecting college faculty personnel with emphasis upon institutional practices and policies. (Typically offered: Irregular)

HIED 6023. Introduction to the Study of Higher Education. 3 Hours.

A requirement for all new doctoral and specialist students. Familiarization with writing requirements, library search procedures, library resources, and program requirements. Prerequisite: Admission to Higher Education Ed.D program. (Typically offered: Irregular)

HIED 605V. Independent Study. 1-6 Hour.

Provides students with an opportunity to pursue special study in higher education. (Typically offered: Fall, Spring and Summer)

HIED 6083. Management Skills for Effective Leadership. 3 Hours.

Development of management skills that enhance leadership includes understanding yourself, managing yourself, team building, personnel selection, group and individual decision-making, problem solving, managing conflict, developing valid performance appraisal systems, conducting performance appraisal interview, and other topics of current interest. Prerequisite: Doctoral students in Higher Education or permission of the instructor. (Typically offered: Irregular)

HIED 6093. Leading Change. 3 Hours.

An in-depth examination of leadership, change, and culture in postsecondary education. (Typically offered: Irregular)

HIED 6303. Advancement in Higher Education. 3 Hours.

Advancement in Higher Education examines the theory and practice of the professional field and function referred to as 'institutional advancement', which is dedicated to attracting philanthropic support as well as building attitudinal and behavioral support among key constituents for colleges and universities. (Typically offered: Irregular)

HIED 6323. Design and Evaluation of College Teaching. 3 Hours.

Theory and practice of effective college teaching. Emphasis is placed on preparation and evaluation of instruction. (Typically offered: Irregular)

HIED 6343. Strategies for Effective College Teaching. 3 Hours.

An examination of traditional and innovative instructional strategies for use in college teaching. (Typically offered: Irregular)

HIED 6353. The College and University Presidency. 3 Hours.

The course explores the basic elements of the presidency of an academic institution and examines the critical issues facing the college and university presidents/chancellors. (Typically offered: Irregular)

HIED 6423. Trends, Issues and Problems in Higher Education. 3 Hours.

A study of the current problems and trends related to the field of higher education. (Typically offered: Irregular)

HIED 6483. Strategic Enrollment Management. 3 Hours.

An examination of admissions marketing strategies, communications plans, branding, and forecasting as well as how other areas (financial aid, honors, scholarships, and student affairs) contribute to successful recruitment efforts. Other key enrollment management areas of focus for the class include academic records, registration, degree audits, FERPA, student support, and most importantly, retention. Major state and federal legislation that underscores any of these activities will be discussed as well. (Typically offered: Irregular)

HIED 6533. Assessment of Institutional Effectiveness in Higher Education. 3 Hours.

The course examines the fundamentals of assessment of learning outcomes and institutional effectiveness and introduces assessment as a tool to inform strategic planning and data-driven decision-making in higher education. (Typically offered: Irregular)

HIED 6643. College Students in the United States. 3 Hours.

Students will engage with the leading theoretical and empirical scholarship related to college students and use this information to engage in class discussion, complete course assignments, consider implications for practice, and contemplate opportunities for new scholarship. Prerequisite: Doctoral student in the Higher Education Program or instructor consent. (Typically offered: Irregular)

HIED 6653. Legal Aspects of Higher Education. 3 Hours.

An examination of the legal status of higher education in the United States; the rights and responsibilities of educators and students including fair employment; due process; torts liability and contracts; student rights landmark court decisions; federal and state legislation having an impact on education. (Typically offered: Fall and Spring)

HIED 6663. Finance and Fiscal Management. 3 Hours.

Higher education finance and budgeting practices: problems, issues, trends, and policy issues in higher education. (Typically offered: Irregular)

HIED 6683. Governance and Policy Making in Higher Education. 3 Hours.

An analysis of governance and policy making affecting the control of colleges and universities. Attention is given to policy generation, governing board supervision, and the impact of institutional, professional, and regional groups as well as community, state, and federal pressures. (Typically offered: Irregular)

HIED 6693. Research Techniques in Higher Education. 3 Hours.

Techniques of research applicable to Higher Education. (Typically offered: Irregular)

HIED 674V. Internship. 1-6 Hour.

Supervised field experiences in student personnel services, college administration, college teaching, institutional research, development, or other areas of college and university work. (Typically offered: Fall, Spring and Summer)

HIED 699V. Seminar. 1-6 Hour.

A series of seminar for specialized study into areas of current significance in postsecondary education, such as leadership and planning; organization, development, and change; human resource development and appraisal; the student in higher education; etc. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

HIED 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

History (HIST) Courses

HIST 5003. Democratic Athens. 3 Hours.

(Formerly HIST 4003.) History of the Athens from the sixth century BCE to the end of the fourth. Topics include origins and evolution of democracy, the Persian wars, the rise and fall of the Athenian Empire, and the development of historiography, literature, art, and philosophy during the period. Graduate degree credit will not be given for both HIST 4003 and HIST 5003. (Typically offered: Irregular)

HIST 5013. Alexander the Great and the Hellenistic World. 3 Hours.

(Formerly HIST 4013.) A survey of the achievements of Alexander and the culture of the new world he created. The personality and career of Alexander are examined as well as the rich diversity of the Hellenistic world: trade with India, religious syncretism, and the development of Hellenistic science and philosophy. Graduate degree credit will not be given for both HIST 4013 and HIST 5013. (Typically offered: Irregular)

HIST 5033. Roman Empire. 3 Hours.

(Formerly HIST 4033.) History of Rome from the Emperor Augustus to Constantine, ca. 30 BCE - 337 CE. Topics include the sources for imperial Rome, the organization of imperial government, the provinces of Rome and provincial government, art and literature under the empire, the rise of Christianity, and the conversion of the Empire. Graduate degree credit will not be given for both HIST 4033 and HIST 5033. (Typically offered: Irregular)

HIST 506V. Readings in European History. 1-6 Hour.

Directed readings in the field of European history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 507V. Readings in American History. 1-6 Hour.

Readings. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 12 hours of degree credit.

HIST 511V. Research Problems in Latin American History. 1-6 Hour.

Research problems in Latin American history. (Typically offered: Irregular)

HIST 517V. Readings in Asian History. 1-6 Hour.

Readings. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 5193. Great Britain, 1901-2001. 3 Hours.

(Formerly HIST 4193.) Examines the history of the British Isles from the death of Queen Victoria in 1901 to the reelection of Prime Minister Tony Blair in 2001. Special attention is given to the collapse of the British Empire, the birth of the welfare state, and the challenges inherent in the decline of British world power. Graduate degree credit will not be given for both HIST 4193 and HIST 5193. (Typically offered: Spring Odd Years)

HIST 5203. History of the Holocaust. 3 Hours.

(Formerly HIST 4203.) Examines the origins, history, and legacies of the European Holocaust. Traces the origins of anti-Semitism in Europe, the rise of Nazism in Germany, the path to genocide during World War II, and the role of victims, perpetrators, rescuers, and bystanders. Considers issues of memory and justice in the postwar era. Graduate degree credit will not be given for both HIST 4203 and HIST 5203. (Typically offered: Irregular)

HIST 522V. Readings in Latin America History. 1-6 Hour.

Readings in Latin American history. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 524V. Readings in African History. 1-6 Hour.

Readings in African history. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 525V. Research Problems in African History. 1-6 Hour.

Research problems in African history. (Typically offered: Irregular)

HIST 526V. Readings in Middle Eastern History. 1-6 Hour.

Readings in Middle Eastern history. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 527V. Readings in Medieval History. 1-6 Hour.

Readings in Medieval history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 528V. Research Problems in Middle Eastern History. 1-6 Hour.

Research problems in Middle Eastern history. (Typically offered: Irregular)

HIST 530V. Readings in British History. 1-6 Hour.

Directed readings in the field of British history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 533V. Readings in Ancient History. 1-6 Hour.

Readings in Ancient history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 534V. Research Problems in Ancient History. 1-6 Hour.

Research problems in Ancient history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HIST 5393. Early Modern Islamic Empires, 1300-1750. 3 Hours.

(Formerly HIST 4393.) An examination of the historical development of the three great Islamic empires in the early modern period- the Ottomans, the Safavids of Iran, and the Mughals of India. Special attention given to imperial expansion, administrative structures, religious-legal establishment, and the formation of distinct traditions in political ideology, historiography, and the arts and sciences. Graduate degree credit will not be given for both HIST 4393 and HIST 5393. (Typically offered: Spring Odd Years)

HIST 5403. Islam in Asia. 3 Hours.

(Formerly HIST 4403.) Introduces students to the history of Islam in East and Southeast Asia over the past 1,200 years. It focuses on the 18th-21st centuries when Muslims were part of everyday life in Asia and participated in the formation of majority and minority identities in the region. Graduate degree credit will not be given for both HIST 4403 and HIST 5403. (Typically offered: Irregular)

HIST 545V. Readings in Caribbean History. 1-6 Hour.

Graduate readings in Caribbean history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 546V. Research Problems in Caribbean History. 1-6 Hour.

Independent research in Caribbean history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HIST 547V. Readings in Atlantic History. 1-6 Hour.

Graduate readings in Atlantic world history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 5483. African American Biographies. 3 Hours.

(Formerly HIST 4483.) Introduction to the history and intellectual development of famous and not-so-famous African Americans. Graduate degree credit will not be given for both HIST 4483 and HIST 5483. (Typically offered: Irregular)

HIST 5493. Religion in America to 1860. 3 Hours.

(Formerly HIST 4493.) History of religion in early America, primarily from a social and cultural perspective. Topics will include region, social class, growth of institutions, slavery, print culture, and social reform in traditions including Protestantism, West African religion, Catholicism, Native American religion, and Judaism. Graduate degree credit will not be given for both HIST 4493 and HIST 5493. (Typically offered: Irregular)

HIST 5503. History of Political Parties in the United States, 1789-1896. 3 Hours.

(Formerly HIST 4503.) Origin and development of the American party system from the implementation of the constitution to the election of McKinley. Graduate degree credit will not be given for both HIST 4503 and HIST 5503. (Typically offered: Fall Even Years)

HIST 5513. History of Political Parties in the United States Since 1896. 3 Hours.

(Formerly HIST 4513.) Response of the party system to America's emergence as an industrial nation and world power from the election of 1896 to present. Graduate degree credit will not be given for both HIST 4513 and HIST 5513. (Typically offered: Spring Odd Years)

HIST 5523. Roman Republic. 3 Hours.

(Formerly HIST 4023.) History of Rome from its origins in the eighth century BCE to the fall of the Republic in the first century BCE. Topics include the sources for Roman history, the development, functioning, and ultimate failure of republican government, the Roman army, and Roman imperialism in Italy and the Mediterranean. Graduate degree credit will not be given for both HIST 4023 and HIST 5523. (Typically offered: Irregular)

HIST 5543. American Social and Intellectual History Since 1865. 3 Hours.

(Formerly HIST 4543.) Survey of thought and society since the Civil War. Graduate degree credit will not be given for both HIST 4543 and HIST 5543. (Typically offered: Irregular)

HIST 5563. The Old South, 1607-1865. 3 Hours.

(Formerly HIST 4563.) Survey of the political, social, and economic development of the antebellum South. Graduate degree credit will not be given for both HIST 4563 and HIST 5563. (Typically offered: Fall Odd Years)

HIST 5573. The New South, 1860 to the Present. 3 Hours.

(Formerly HIST 4573.) Survey of the development of the Civil War and postwar South to the present. Graduate degree credit will not be given for both HIST 4573 and HIST 5573. (Typically offered: Fall Even Years)

HIST 5583. Arkansas in the Nation. 3 Hours.

(Formerly HIST 4583.) Designed to provide advanced undergraduate and graduate students with a comprehensive understanding of the full sweep of Arkansas history. The focus will be on social, economic and political history, and historiography. Graduate degree credit will not be given for both HIST 4583 and HIST 5583. (Typically offered: Irregular)

HIST 5593. The Colonial French in the Mississippi Valley. 3 Hours.

(Formerly HIST 4593.) This course focuses on the French Colonial Mississippi Valley from 1698 until 1763. Activities for both French and non-French speaking students provide a rich environment to discuss encounters, subsistence strategies, and warfare faced by native peoples, missionaries, explorers, and colonists alike. Students will examine primary handwritten, transcribed, or translated sources. Graduate degree credit will not be given for both HIST 4593 and HIST 5593. (Typically offered: Spring)

HIST 5603. U.S. Labor History to 1877. 3 Hours.

(Formerly HIST 4603.) Examines the changing nature of work in U.S. history from 1607 until 1877 including the ways that workers--individually and collectively--understand the meanings of their labor and to the ways that notions of class, gender, ethnicity, and race inform these understandings. Graduate degree credit will not be given for both HIST 4603 and HIST 5603. (Typically offered: Fall Odd Years)

HIST 5613. Colonial America 1600-1763. 3 Hours.

(Formerly HIST 4613.) History of colonial America from 1600 to the end of the Seven Years War emphasizing economic, social, and cultural perspectives. Topics include Native American, French, Spanish, English, Dutch, and Russian interactions in North America and the larger Atlantic World. Graduate degree credit will not be given for both HIST 4613 and HIST 5613. (Typically offered: Irregular)

HIST 5623. Revolutionary America, 1763 to 1789. 3 Hours.

(Formerly HIST 4623.) History of revolutionary America emphasizing economic, social, and cultural perspectives. Topics include historical interpretations of the causes of the war, the impact of war on African Americans, women, loyalists, elite, and poor Americans. The course also examines the formation of the new national government. Graduate degree credit will not be given for both HIST 4623 and HIST 5623. (Typically offered: Irregular)

HIST 5643. Early American Republic, 1789-1828. 3 Hours.

(Formerly HIST 4643.) History of the early United States emphasizing social and cultural perspectives. Topics addressed will include westward expansion, slavery, religion, and economic change. Graduate degree credit will not be given for both HIST 4643 and HIST 5643. (Typically offered: Irregular)

HIST 5653. Antebellum America, 1828-1850. 3 Hours.

(Formerly HIST 4653.) History of antebellum U.S. emphasizing social and cultural perspectives. Topics addressed will include slavery, religion, gender, the market economy, regionalism, and political developments. Graduate degree credit will not be given for both HIST 4653 and HIST 5653. (Typically offered: Irregular)

HIST 5663. Rebellion to Reconstruction, 1850-1877. 3 Hours.

(Formerly HIST 4663.) A survey of political, social, and economic issues from the late antebellum period through Reconstruction. Emphasis is placed on the causes of the Civil War and the problems of postwar America. A brief examination of the Civil War is included. Graduate degree credit will not be given for both HIST 4663 and HIST 5663. (Typically offered: Irregular)

HIST 5673. The American Civil War. 3 Hours.

(Formerly HIST 4673.) An intensive study of the political, social, military, and economic aspects of the American Civil War period. Graduate degree credit will not be given for both HIST 4673 and HIST 5673. (Typically offered: Fall)

HIST 5683. The American Civil Rights Movement. 3 Hours.

(Formerly HIST 4383.) Introduction to the history and development of the civil rights movement in the United States. Graduate degree credit will not be given for both HIST 4383 and HIST 5683. (Typically offered: Irregular)

HIST 5693. Late Middle Ages. 3 Hours.

(Formerly HIST 4053.) This course examines the political, social-economic, intellectual, and spiritual developments of European history, c. 1000-1400 CE. Special topics include monasticism, sacral kingship, the crusades, and the medieval university. Graduate degree credit will not be given for both HIST 4053 and HIST 5693. (Typically offered: Spring Odd Years)

HIST 570V. Special Topics. 1-6 Hour.

Special topics. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

HIST 5723. America Between the Wars, 1917-1941. 3 Hours.

(Formerly HIST 4723.) The impact of World War I, the 1920s, and the Great Depression upon American society and culture. Graduate degree credit will not be given for both HIST 4723 and HIST 5723. (Typically offered: Irregular)

HIST 573V. Readings in Global History. 1-6 Hour.

Directed readings in the field of Global history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

HIST 5753. Diplomatic History of the United States, 1776-1900. 3 Hours.

(Formerly HIST 4753.) Survey of American foreign relations from the American Revolution through the Spanish-American War. Principal topics include isolationism, freedom of the seas, manifest destiny and continental expansion, overseas expansion, and the diplomacy of war and peace. Emphasis on the relationship between domestic politics and foreign affairs. Graduate degree credit will not be given for both HIST 4753 and HIST 5753. (Typically offered: Fall Even Years)

HIST 5763. Diplomatic History of the United States, 1900-1945. 3 Hours.

(Formerly HIST 4763.) America's development as a world power. The course examines U.S. relations with Europe, Latin America, and East Asia, plus America's first approach to the Middle East. Particular emphasis is placed on America's involvement in World War I and World War II. Graduate degree credit will not be given for both HIST 4763 and HIST 5763. (Typically offered: Spring Odd Years)

HIST 5773. Diplomatic History of the US, 1945 to Present. 3 Hours.

(Formerly HIST 4773.) U.S. involvement in world affairs since WWII. The Cold War from an international perspective, including strategies, nuclear deterrence, conflicts, economic developments, cultural relations among allies and adversaries. Post-Cold War scenarios, including war on terrorism. Graduate degree credit will not be given for both HIST 4773 and HIST 5773. (Typically offered: Fall Odd Years)

HIST 5783. History of Modern Mexico. 3 Hours.

(Formerly HIST 4783.) This course examines the history of Mexico from the wars of independence to the present. Emphasis will be placed on the turbulent nineteenth century and the Mexican Revolution. Themes covered include colonial legacies, national identities, popular culture, emigration, and relations with the United States. Graduate degree credit will not be given for both HIST 4783 and HIST 5783. (Typically offered: Irregular)

HIST 5793. Colonial India, 1758-1948. 3 Hours.

(Formerly HIST 4793.) Examines the course of Indian history from the 1758 Battle of Plassey to eventual independence from Great Britain in 1948. Special attention is given to India's place within the British Empire, particularly the East Indian Company, the Indian Mutiny, the Raj, the rise of Gandhi, and India's independence movement. Graduate degree credit will not be given for both HIST 4793 and HIST 5793. (Typically offered: Irregular)

HIST 5803. Modern Scandinavia. 3 Hours.

(Formerly HIST 4803.) Examines the history of the Nordic lands, including Denmark, Finland, Iceland, Norway, and Sweden, from 1500 to the present. Graduate degree credit will not be given for both HIST 4803 and HIST 5803. (Typically offered: Irregular)

HIST 5813. Africans and Slavery in Colonial Latin America. 3 Hours.

(Formerly HIST 4813.) Explores the diverse experiences of slaves and free Blacks in colonial Spanish and Portuguese America from 1500 to around 1888, demonstrating that bondage and the practice of African slavery was a pillar of political authority in colonial Latin America. Graduate degree credit will not be given for both HIST 4813 and HIST 5813. (Typically offered: Irregular)

HIST 5823. Black Freedom in the Age of Emancipation. 3 Hours.

(Formerly HIST 4823.) This course centers on the comparative study of Atlantic World freedom movements from the perspective of the African Diaspora. It focuses on the histories, meanings, legacies of the various types of black emancipation in the Atlantic World and the cultural technologies that enabled them. Graduate degree credit will not be given for both HIST 4823 and HIST 5823. (Typically offered: Spring)

HIST 5833. Social and Cultural History of the Modern Middle East. 3 Hours.

(Formerly HIST 4433.) An analysis of Middle East history in the 17th-20th centuries which focuses on the social transformation of urban and rural life. Particular emphasis is given to the roles of economics, genealogy, art, and popular culture. Graduate degree credit will not be given for both HIST 4433 and HIST 5833. (Typically offered: Irregular)

HIST 5843. The Atlantic World, 1400-1850. 3 Hours.

(Formerly HIST 4233.) Explores the political, economic, cultural, and social engagement of Africans, Europeans, and Native Americans across the Atlantic from 1400 to 1850. It uses a comparative lens to understand how interactions between Europe, Africa, and the Americas created enduring ties throughout the Atlantic Basin. Graduate degree credit will not be given for both HIST 4233 and HIST 5843. (Typically offered: Irregular)

HIST 5873. Germany since 1945. 3 Hours.

(Formerly HIST 4873.) Examines the history of Germany since the end of the Second World War including political division and economic recovery, dissident movements in East Germany and alternative cultures in West Germany, reunification in 1990, and the legacy of Nazism and the Holocaust. Graduate degree credit will not be given for both HIST 4873 and HIST 5873. (Typically offered: Irregular)

HIST 5883. Health and Disease: 1500 to the Present. 3 Hours.

(Formerly HIST 4883.) Explores the emergence of epidemics against the backdrop of the nation state and anxieties over women, the lower classes, and other marginalized groups. The rise of modern health programs illuminates the cultural construction of medicine, the biases of scientific inquiry, and the tensions among paternalism, liberty, and prejudice. Graduate degree credit will not be given for both HIST 4883 and HIST 5883. (Typically offered: Irregular)

HIST 5893. Germany, 1918-1945. 3 Hours.

(Formerly HIST 4253.) Study of German history from advent of the Weimar Republic to the end of the Third Reich with emphasis upon the failure of democratic government in the 1920s and the rise and fall of the National Socialist dictatorship. Graduate degree credit will not be given for both HIST 4253 and HIST 5893. (Typically offered: Irregular)

HIST 5943. U.S. Labor History, from 1877-present. 3 Hours.

(Formerly HIST 4943.) This course will examine the changing nature of work in U.S. history from 1877 until the present. It will pay particular attention to the ways that workers--individually and collectively--understand the meanings of their labor and to the ways that notions of class, gender, ethnicity, and race inform these understandings. Graduate degree credit will not be given for both HIST 4943 and HIST 5943. (Typically offered: Spring Even Years)

HIST 5963. Third World Underdevelopment and Modernization. 3 Hours.

(Formerly HIST 4963.) Examines key issues related to societal change in the Third World, including various views and theories of international development and modernization. Other major issues explored include social inequalities, food and hunger, population, environment, trade and globalization, international aid, and the roles of state, market, and civil society. Graduate degree credit will not be given for both HIST 4963 and HIST 5963. (Typically offered: Irregular)

HIST 5973. The Civilization of the Renaissance in Italy. 3 Hours.

Important trends in Italian culture between the 14th and 16th centuries, including the birth of humanism, new understandings of the past, 'new' political ideologies, scientific innovation, and famous art produced in the Western tradition. (Typically offered: Irregular)

HIST 5983. Intellectual History of Europe Since the Enlightenment. 3 Hours.

(Formerly HIST 4143.) A survey of the major developments in European thought and culture since the emergence of Romanticism. Topics include Romanticism, Darwinism, Marxism, and Modernism. Graduate degree credit will not be given for both HIST 4143 and HIST 5983. (Typically offered: Fall Even Years)

HIST 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIST 6013. The Era of the French Revolution. 3 Hours.

(Formerly HIST 4213.) France from the salons of the Enlightenment to the Napoleonic Wars. The French Revolution will be explored in terms of politics and personalities, ideas and symbols, class and gender relations, and violence and terror. Graduate degree credit will not be given for both HIST 4213 and HIST 6013. (Typically offered: Fall Odd Years)

HIST 6033. Society and Gender in Modern Europe. 3 Hours.

(Formerly HIST 4133.) Changing values and attitudes toward childhood, family life, sexuality, and gender roles in Europe from the Renaissance to the present. The social impact of the Industrial Revolution, urbanization, demographic change, and the two world wars. Graduate degree credit will not be given for both HIST 4133 and HIST 6033. (Typically offered: Spring Odd Years)

HIST 6063. Tudor-Stuart England, 1485-1714. 3 Hours.

(Formerly HIST 4163.) Examines the history of the British Isles from the ascension of Henry VII and the Tudor dynasty until the close of the Stuart Era in 1714. Special attention is given to the English Reformation, the Elizabethan years, the 17th Century Revolutions, and the birth of an overseas Empire. Graduate degree credit will not be given for both HIST 4163 and HIST 6063. (Typically offered: Spring Even Years)

HIST 6073. Renaissance and Reformation, 1300-1600. 3 Hours.

(Formerly HIST 4073.) Examines the history of Europe from the end of the Middle Ages through the Renaissance to the Reformation and Counter-Reformation. Special attention is paid to changes in popular piety, political thought, religious representation, and the discovery of the New World. Graduate degree credit will not be given for both HIST 4073 and HIST 6073. (Typically offered: Fall Even Years)

HIST 6083. Early Modern Europe, 1600-1800. 3 Hours.

(Formerly HIST 4083.) Begins with the upheaval of the reformation, moves through the crisis of the 17th century and culminates with the democratic revolution of the 18th century. Examines the consolidation of the European state system, the propagation of modern science, discovery of overseas worlds, and the advent of the Industrial Revolution. Graduate degree credit will not be given for both HIST 4083 and HIST 6083. (Typically offered: Spring Odd Years)

HIST 6093. The History of African Americans and Social Justice. 3 Hours.

(Formerly HIST 4093.) Explores how the United States has extended social justice to African Americans during the nation's history. Examines social justice for blacks and the impact of historic policies and practices on black life today. Graduate degree credit will not be given for both HIST 4093 and HIST 6093. (Typically offered: Irregular)

HIST 6113. Archaic Greece. 3 Hours.

(Formerly HIST 4113.) History of Greece from the late Bronze Age to the end of the Persian Wars. This class will focus particularly on the sources involved with reconstructing early Greek history, especially Herodotus and Homer, on the development of the Greek city-state or polis, and on the interaction between the Greeks and Near-eastern civilizations during this period, culminating in the wars between the Greeks and the Persian Empire. Graduate degree credit will not be given for both HIST 4113 and HIST 6113. (Typically offered: Irregular)

HIST 6173. The Latin American City. 3 Hours.

(Formerly HIST 4173.) This course examines the social, political, and cultural aspects of the modern Latin American city from an interdisciplinary perspective. The course includes an introduction to urban studies concepts, and each semester is organized around a specific set of case studies. Graduate degree credit will not be given for both HIST 4173 and HIST 6173. (Typically offered: Irregular)

HIST 6183. Great Britain 1707-1901. 3 Hours.

(Formerly HIST 4183.) Examines the history of the British Isles from the 1707 Act of Union between Scotland and England until the death of Queen Victoria in 1901. Special attention is given to the spread of Empire, industrialization, and the political, social, and cultural aspects of the Georgian and Victorian Eras. Graduate degree credit will not be given for both HIST 4183 and HIST 6183. (Typically offered: Fall Even Years)

HIST 6203. Byzantine Empire. 3 Hours.

(Formerly HIST 4103.) Examines the history and culture of the Byzantine Empire from the reign of Constantine I to the fall of Constantinople in 1453. Topics include the development of Christianity and the schism with the western church, the crusades, and Byzantine influence on Islam, Russia, the Ottomans, and the Renaissance. Graduate degree credit will not be given for both HIST 4103 and HIST 6203. (Typically offered: Irregular)

HIST 6223. France Since 1815. 3 Hours.

(Formerly HIST 4223.) Survey of French history from the overthrow of Napoleon to the 5th Republic, with emphasis on French politics, society, and culture. Graduate degree credit will not be given for both HIST 4223 and HIST 6223. (Typically offered: Spring Even Years)

HIST 6243. Germany, 1789-1918. 3 Hours.

(Formerly HIST 4243.) Study of German history from the Age of Absolutism to the collapse of the German Empire at the end of the First World War. Special attention is paid to the Enlightenment and Romantic movements; nationalism and the unification of Germany; and evolving conflicts over the political and social order. Graduate degree credit will not be given for both HIST 4243 and HIST 6243. (Typically offered: Irregular)

HIST 6263. Independence and Africa Today. 3 Hours.

(Formerly HIST 4263.) Examines the last half-century of Africa's history, focusing on the last few decades. Introduction of Africa's colonial past, revolutions and struggles for independence. Review of African development in the post-colonial and contemporary era, successes and failures of independent Africa, and the challenges the continent faces today. Graduate degree credit will not be given for both HIST 4263 and HIST 6263. (Typically offered: Spring)

HIST 6273. Comparative Slavery. 3 Hours.

(Formerly HIST 4273.) Explores the meaning of slavery around the world, both in ancient and modern times. This examination of how slavery differed in various cultures over time will allow students to explore the complexity of this labor relationship and gain a better understanding of how slavery was an integral part of world history. Graduate degree credit will not be given for both HIST 4273 and HIST 6273. (Typically offered: Irregular)

HIST 6293. Latin American Environmental History. 3 Hours.

Explores the challenges, debates, and ecologies of Latin America in order to understand the historical roots of current environmental crises. It engages a historiography on ecosystems found in the region. Uses environmental history texts and scholarly articles to build a layered and transnational approach. (Typically offered: Irregular)

HIST 6303. Transatlantic Relations, 1919-Present. 3 Hours.

(Formerly HIST 4303.) US-Western European Relations, from the Wilsonian era to the present, covering strategic, economic, and cultural aspects. Graduate degree credit will not be given for both HIST 4303 and HIST 6303. (Typically offered: Irregular)

HIST 6333. Modern Islamic Thought. 3 Hours.

(Formerly HIST 4333.) Main currents in Islamic theology and political philosophy from the Ottoman Empire to the end of the twentieth century. Graduate degree credit will not be given for both HIST 4333 and HIST 6333. (Typically offered: Irregular)

HIST 6343. Golden Age Portugal and Spain. 3 Hours.

(Formerly HIST 4343.) This course will examine the diverging and converging paths of Portugal and Spain during the early modern period (15th-17th centuries). We will chart their rise as global imperial powers and their initial declines. We'll explore the political, social, and religious contexts in which Golden Age Iberia flourished. Graduate degree credit will not be given for both HIST 4343 and HIST 6343. (Typically offered: Irregular)

HIST 6463. The American Frontier. 3 Hours.

(Formerly HIST 4463.) American westward expansion and its influence on national institutions and character. Emphasis on the pioneer family and the frontier's role in shaping American society, culture, economy, and politics. Topics include exploration, the fur trade, the cattle kingdom and the mining, farming, and military frontiers. Graduate degree credit will not be given for both HIST 4463 and HIST 6463. (Typically offered: Fall Odd Years)

HIST 6473. Environmental History. 3 Hours.

(Formerly HIST 4473.) Examines the interactions between human culture and the natural environments: Concepts of nature in the West and elsewhere, dynamics of the Physical Environment, case studies in Regional Environmental History and the Politics of Environmental movements. Graduate degree credit will not be given for both HIST 4473 and HIST 6473. (Typically offered: Irregular)

HIST 6513. New Women in the Middle East. 3 Hours.

(Formerly HIST 4413.) This course covers the transformation of social and cultural roles of women in the Middle East since the 19th Century. Emphases include political emancipation, religious reformation, artistic representation, and gendered re-definition. Graduate degree credit will not be given for both HIST 4413 and HIST 6513. (Typically offered: Irregular)

HIST 6523. Wars of Religion: From the Crusades to 9/11. 3 Hours.

(Formerly HIST 4323.) Examines the place of religion in combat across the centuries. A case study approach is used to explore different conflicts from the twelfth century crusades against Muslim forces to 9/11. Investigates how religious motivations may or may not be related to other political, social, cultural, economic concerns. Graduate degree credit will not be given for both HIST 4323 and HIST 6523. (Typically offered: Irregular)

HIST 6543. Late Antiquity and the Early Middle Ages. 3 Hours.

(Formerly HIST 4043.) This course examines the political, spiritual, intellectual, and social-economic developments of European history, c. 300-1000 CE. Special topics include the Christianization of the late Roman Empire and Byzantium, as well as the formation of Celtic and Germanic Kingdoms in the West. Graduate degree credit will not be given for both HIST 4043 and HIST 6543. (Typically offered: Fall Even Years)

HIST 6563. The Middle East since 1914. 3 Hours.

(Formerly HIST 4363.) Middle East since 1914 addresses European colonialism, the rise of new social elites, independence, revolution, globalization, economic self-determination, persistent regional conflicts and ongoing battles over 'cultural authenticity'. Graduate degree credit will not be given for both HIST 4363 and HIST 6563. (Typically offered: Irregular)

HIST 6623. Africa and the Trans-Atlantic Slave Trade. 3 Hours.

(Formerly HIST 4123.) Examines the trans-Atlantic slave trade with a primary focus on the role of Africa and Africans in creating the unique economy and culture of the trans-Atlantic world. Graduate degree credit will not be given for both HIST 4123 and HIST 6623. (Typically offered: Irregular)

HIST 6643. Frontiers and Borderlands in Colonial Latin America. 3 Hours.

(Formerly HIST 4443.) This course examines frontiers and borderlands in colonial Latin America and focuses on the regions of California, New Mexico, Texas, Brazil, and the Río de la Plata. It demonstrates that frontiers and borderlands are defined by the absence of a hegemonic European power and associated with the prevalence of Indigenous norms. Graduate degree credit will not be given for both HIST 4443 and HIST 6643. (Typically offered: Irregular)

HIST 6703. Emergence of Modern America, 1876-1917. 3 Hours.

(Formerly HIST 4703.) A survey of the impact of the Industrial Revolution, Imperialism, and progressivism upon American life and institutions. Graduate degree credit will not be given for both HIST 4703 and HIST 6703. (Typically offered: Fall Odd Years)

HIST 6733. Recent America, 1941 to the Present. 3 Hours.

(Formerly HIST 4733.) A general survey of American history since World War II with emphasis upon the presidency, reform movements, the Cold War, and cultural developments. Graduate degree credit will not be given for both HIST 4733 and HIST 6733. (Typically offered: Irregular)

HIST 6743. The Cold War in Latin America: Revolutions, Violence, and Politics. 3 Hours.

(Formerly HIST 4743.) This course will trace the rise of the ideological and political struggles over social and economic development and the security regimes designed to thwart socialist revolution and political mobilization. The influence of the United States in Latin American security regimes and 'containment' activities will receive special attention. Graduate degree credit will not be given for both HIST 4743 and HIST 6743. (Typically offered: Irregular)

HIST 6843. Global History of Soccer. 3 Hours.

Prompts students to explore the various historical processes related to the global diffusion of and engagement with soccer. Examines the ways soccer has reflected the broader, ongoing process of globalization, with players, ideas, tactics, and wealth circulating throughout the globe. (Typically offered: Irregular)

HIST 6993. History of the Ottoman Empire, 1300-1923. 3 Hours.

History of the Ottoman Empire from its emergence as frontier principality in Anatolia ca. 1300, through its heyday as a major imperial power on three continents in the fifteenth through the eighteenth centuries, ending with its encounter with western imperialism and nationalism in the nineteenth and early twentieth centuries. (Typically offered: Irregular)

HIST 700V. Doctoral Dissertation. 1-18 Hour.

Independent research and writing leading to the completion of a doctoral dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HIST 7023. Historical Methods. 3 Hours.

Practical introduction to historical research and writing. Consists of lecture, library reading, and class criticism of research papers. Prerequisite: Graduate standing. (Typically offered: Fall)

HIST 7043. Historiography. 3 Hours.

Survey of the history of historical writing and a study of the important schools and historical interpretation. Prerequisite: Graduate standing. (Typically offered: Irregular)

HIST 7053. Reading Seminar in Asian History. 3 Hours.

Concentrated reading in selected specialized areas of Asian history. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7103. Reading Seminar in American History. 3 Hours.

Historiographical and bibliographical study of special areas of U.S. history, such as Antebellum America, the Civil War, etc. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7123. Research Seminar in History. 3 Hours.

Research projects in selected fields of history, such as political history, gender history, history of race, etc. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7133. Reading Seminar in European History. 3 Hours.

Historiographical and bibliographical study of special periods in European history, such as the Roman Empire, the late Middle Ages, the French Revolution, etc. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7153. Reading Seminar in British History. 3 Hours.

Historiographical and bibliographical study of selected periods of British history. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7213. Reading Seminar in Middle Eastern History. 3 Hours.

Historiographical and bibliographical study of special areas of Middle Eastern history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7313. Reading Seminar in Latin American History. 3 Hours.

Historiographical and bibliographical study of special areas in Latin American history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7353. Reading Seminar in Medieval History. 3 Hours.

Historiographical and bibliographical study of special areas in medieval history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7373. Reading Seminar in Ancient History. 3 Hours.

Historiographical and bibliographical study of special areas in ancient history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7413. Reading Seminar in African History. 3 Hours.

Historiographical and bibliographical study of selected periods and/or topics in African history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7433. Reading Seminar in Caribbean History. 3 Hours.

Historiographical and bibliographical study of special areas in Caribbean history. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 30 hours of degree credit.

HIST 7453. Reading Seminar in Global History. 3 Hours.

Graduate seminar adopting global perspectives on Europe, US, Asia, Africa, Latin America. Decentering narratives focusing on regional approaches, the course examines the global implications of various historical developments. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Horticulture (HORT)

Courses

HORT 5001. Seminar. 1 Hour.

Review of scientific literature and oral reports on current research in horticulture. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

HORT 501V. Special Topics in Horticulture, Turf or Landscape. 1-6 Hour.

(Formerly HORT 401V.) Topics related to horticulture, turfgrass or landscape science or management not covered in other courses or a more intensive study of a specific topic. Graduate degree credit will not be given for both HORT 401V and HORT 501V. (Typically offered: Irregular) May be repeated for degree credit.

HORT 502V. Horticulture Judging and Competition Activity. 1-6 Hour.

(Formerly HORT 402V.) Training for and participation on horticultural identification, judging and competitive teams. Graduate degree credit will not be given for both HORT 402V and HORT 502V. Prerequisite: HORT 2003. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HORT 503V. Special Problems Research. 1-6 Hour.

Original investigations on assigned problems in horticulture. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HORT 5043. Advanced Plant Breeding. 3 Hours.

Application of genetic principles to the improvement of crop plants. Presentation of conventional plant breeding methods and special techniques such as polyploidy, interspecific hybridization and induced mutation. Lecture 3 hours per week. Prerequisite: BIOL 2323 and BIOL 2321L or (ANSC 3123 and CSES 4103). (Typically offered: Spring Odd Years)

HORT 5103. Plant Growth and Development. 3 Hours.

This course will focus on environmental and developmental processes of plant growth and development. A student completing this course should have an understanding of the developmental processes of plant growth and how environmental factors interact to affect and control plant growth and development. (Typically offered: Fall)

HORT 5113. Fruit Production Science and Technology. 3 Hours.

(Formerly HORT 4103.) The management technologies and cultural practices of fruit crops including (but not limited to) blueberries, blackberries, raspberries, strawberries, grapes, peaches, and apples will be presented. The underlying scientific principles of crop genetics, nutrition, and physiology will be presented as a basis for making management decisions in fruit crop productions. Graduate degree credit will not be given for both HORT 4103 and HORT 5113. Corequisite: Lab component. Prerequisite: HORT 2003. (Typically offered: Spring Odd Years)

HORT 5143. Professional Landscape Management. 3 Hours.

Principles and practices of landscape management and maintenance. Topics include low maintenance and seasonal color design, pruning and hazard tree management, water and fertilizer management, pesticide use, and other maintenance activities. Basic elements of marketing, specifications and contracts, estimating, personnel management, and equipment selection and acquisition relevant for landscape services will be introduced. Preparatory training in agribusiness or business is suggested. Prerequisite: HORT 2003 and HORT 3103. (Typically offered: Fall Odd Years)

HORT 5153. Sustainable Techniques in Urban Horticulture. 3 Hours.

Student will learn basic techniques in sustainable production of horticultural crops in an urban or small-scale environment. Crops may include vegetables, cut flowers, or small fruits. This course is intended for students who do not have an agricultural production background or for those students wanting to learn more about the production of high-value horticultural crops under sustainable production systems. For graduate credit, students will be expected to design a four-year crop rotation scheme using sustainable techniques. The student will also develop a plan addressing issues such as post-harvest handling and or food safety issues. (Typically offered: Summer)

HORT 5203. Temperature Stress Physiology. 3 Hours.

This course will teach students how to apply biological, chemical and physical principles to models of how plants are damaged by temperature extremes and how they change to increase resistance. Student will apply these principles to better understand plant responses to other environmental challenges, including both biotic and abiotic stresses. (Typically offered: Spring)

HORT 530V. Special Problems. 1-6 Hour.

(Formerly HORT 400V.) Original investigations on assigned problems in horticulture. Graduate degree credit will not be given for both HORT 400V and HORT 530V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HORT 5333. Professional Landscape Installation and Construction. 3 Hours.

(Formerly HORT 4033.) Principles and practices involved in landscape installation and construction. Topics covered include sequencing construction activities, protecting existing trees, landscape soils, selecting plants, planting and transplanting plant materials, wood construction, cement and masonry construction, and low-voltage lighting. Lecture 3 hours per week. Preparatory training in agribusiness or business is suggested. Graduate degree credit will not be given for both HORT 4033 and HORT 5333. Prerequisite: HORT 2003. (Typically offered: Fall Even Years)

HORT 5403. Plant Propagation. 3 Hours.

(Formerly HORT 4403.) Principles of plant propagation using seeds, cuttings, grafting, budding, layering, and tissue culture. The physiological basis of propagation is described. Knowledge of plant growth and physiology is needed. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both HORT 4403 and HORT 5403. Corequisite: Lab component. Prerequisite: BIOL 1613 and BIOL 1611L. (Typically offered: Spring)

HORT 5413. Horticulture Physiology. 3 Hours.

(Formerly HORT 4413.) This course provides students with a background into the physiological processes of plants with an emphasis on horticultural crops and how the processes relate to horticultural crop production practices. Among the topics covered are photosynthesis, respiration, water relations and morphogenesis. Graduate degree credit will not be given for both HORT 4413 and HORT 5413. Prerequisite: HORT 2003 and CHEM 1073. (Typically offered: Spring)

HORT 5503. Sustainable Nursery Production. 3 Hours.

(Formerly HORT 4503.) This course addresses issues and practices involved in production of quality woody nursery crops (e.g. trees and shrubs produced in open filed and containerized systems). Graduate degree credit will not be given for both HORT 4503 and HORT 5503. (Typically offered: Spring Even Years)

HORT 5701L. Greenhouse Management and Controlled Environment Horticulture Laboratory. 1 Hour.

(Formerly HORT 4701L.) Laboratory involving hands-on experiments designed to demonstrate principles discussed in the lecture section. Includes field trips. Graduate degree credit will not be given for both HORT 4701L and HORT 5701L. Corequisite: HORT 5703. (Typically offered: Fall Odd Years)

HORT 5703. Greenhouse Management and Controlled Environment Horticulture. 3 Hours.

(Formerly HORT 4703.) Operation and management of greenhouses and other controlled environments used in horticultural production. Emphasis on system design and construction, control of light intensity and photoperiod, heating and cooling systems, substrates, mineral nutrition, water quality and irrigation systems. Graduate degree credit will not be given for both HORT 4703 and HORT 5703. Prerequisite: HORT 2003 and CHEM 1073. (Typically offered: Fall)

HORT 5801L. Greenhouse Crops Production Laboratory. 1 Hour.

(Formerly HORT 4801L.) Laboratory involving hands-on experiments designed to demonstrate principles discussed in the lecture section. Includes field trips. Graduate degree credit will not be given for both HORT 4801L and HORT 5801L. Corequisite: HORT 5803. (Typically offered: Spring Even Years)

HORT 5803. Greenhouse Crops Production. 3 Hours.

(Formerly HORT 4803.) Principles and practices of production and marketing of crops commonly grown in controlled environments including flowering containerized herbaceous species, geophytes, annual and perennial bedding plants, hydroponic vegetables and herbs. Graduate degree credit will not be given for both HORT 4803 and HORT 5803. Prerequisite: HORT 4703 or HORT 5703 (formerly HORT 4703). (Typically offered: Spring Even Years)

HORT 5903. Golf and Sports Turf Management. 3 Hours.

(Formerly HORT 4903.) Turf management techniques for golf courses, and athletic fields including species selection, root-zone construction and modification, fertilization, mowing, irrigation and pest control. Graduate degree credit will not be given for both HORT 4903 and HORT 5903. Corequisite: Lab component. Prerequisite: CSES 2203 and CSES 2201L and (HORT 2303 or HORT 3403). (Typically offered: Fall Odd Years)

HORT 5913. Rootzone Management for Golf and Sports Turf. 3 Hours.

(Formerly HORT 4913.) An overview of the fundamental concepts of the physical and chemical properties of rootzones as related to construction and turfgrass management. Graduate degree credit will not be given for both HORT 4913 and HORT 5913. Corequisite: Lab component. Prerequisite: HORT 2303. (Typically offered: Spring Odd Years)

HORT 5921. Golf Course Operations. 1 Hour.

(Formerly HORT 4921.) This course is designed to cover specific aspects of golf course operations that would not be included in traditional turfgrass management courses. Topics will include budgeting, personnel management, tournament setup and operation, dealing with golf club committees, communication, and other relevant topics related to managing a golf course maintenance operation. Graduate degree credit will not be given for both HORT 4921 and HORT 5921. Prerequisite: HORT 4903 or HORT 5903 (formerly HORT 4903). (Typically offered: Fall Even Years)

HORT 5932. Turf Best Management Practices. 2 Hours.

(Formerly HORT 4932.) The course covers the impacts of turfgrass management practices on turf quality and the environment. In addition, the identification, biology, and control practices for the major insects, diseases, and weeds that infest turf will be covered. Emphasis will be placed on management strategies that include both chemical and non-chemical approaches to the prevention and control of common turfgrass pests. Graduate degree credit will not be given for both HORT 4932 and HORT 5932. Prerequisite: HORT 2303, PLPA 3003 and ENTO 3013. (Typically offered: Spring Odd Years)

HORT 5993. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is cross-listed with AGED 5993, FDSC 5993.

HORT 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HORT 602V. Special Topics in Horticulture. 1-3 Hour.

Discussion and advanced studies on selected topics in genetics, plant breeding, physiology and culture of horticultural crops. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

HORT 6033. Molecular Plant Breeding. 3 Hours.

In-depth study of genetic improvement and techniques. Covers both current and classical literature. Topics to be discussed: haploidy, genetic control of pairing, somatic instability, tissue culture and protoplast fusion, and male sterility. Lecture discussion 3 hours per week. Prerequisite: BIOL 2323 and BIOL 2321L (or ANSC 3123 and CSES 4103 or equivalent). (Typically offered: Fall)

HORT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. May be repeated for degree credit. Prerequisite: Graduate Standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

Human Environmental Sciences (HESC) Courses

HESC 500V. Special Problems. 1-6 Hour.

(Formerly HESC 400V.) Special problems. Graduate degree credit will not be given for both HESC 400V and HESC 500V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

HESC 502V. Special Problems Research. 1-6 Hour.

Individual study or research for graduates in the field of human environmental sciences. (Typically offered: Fall, Spring and Summer)

HESC 5053. Survey Design and Scale Development. 3 Hours.

This course is designed to provide the expertise required to design and conduct survey research. Students will understand the instruments (scales/questionnaire) used in data collection processes and acquire the statistical skills necessary to develop and test these survey instruments. This course uses both theory and practice. Hands-on training will be provided via SPSS package for data analyses, and Qualtrics will be used for web-based surveys. Prerequisite: 3 hours of graduate-level statistics coursework and HESC 5463 or AGED 5463 or instructor consent. (Typically offered: Spring)

This course is cross-listed with AGED 5493.

HESC 5111. Introduction to Graduate Program. 1 Hour.

Overview of graduate program in the School of Human Environmental Sciences. 1 hour. Topics include master's program requirements; graduate student responsibilities; timetable for academic year; forms and deadlines; scheduling and time management; library searches; fundamentals of writing literature reviews; quantitative, qualitative, and mixed research methods; secondary data analyses; and tips for research presentations. Prerequisite: Departmental Consent. (Typically offered: Fall)

HESC 5211. Professional Development. 1 Hour.

Discussion of current literature and research. 1 hour. Topics include diverse research topics and methods in Human Environmental Sciences, professional development, and career opportunities in academia and industry. Prerequisite: HESC 5111 or Departmental Consent. (Typically offered: Fall)

HESC 5463. Research Methodology in Social Sciences. 3 Hours.

Logical structure and the method of science. Basic elements of research design; observation, measurement, analytic method, interpretation, verification, presentation of results. Applications to research in the economic and sociological problems of agriculture and Human Environmental Sciences. Prerequisite: Graduate standing. (Typically offered: Fall)

This course is cross-listed with AGED 5463.

HESC 555V. Special Topics in Human Environmental Sciences. 1-3 Hour.

Topics not covered in other courses or a more intensive study of specific topics in the specializations of human environmental sciences. (Typically offered: Irregular)

HESC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

HESC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Human Resource and Workforce Development Education (HRWD) Courses

HRWD 5113. Foundations of Human Resource & Workforce Development. 3 Hours.

An overview of human resource and workforce development (HRWD) in organizations. Focus on the integration of training and development, career development, and organization development. Topics include strategic planning for human resource and workforce development, needs assessment, program development, application of workplace learning theories, career development theories and methods, and application of organization learning theories. (Typically offered: Fall, Spring and Summer)

HRWD 5123. Career Transitions. 3 Hours.

This advanced level course is intended for career development professionals and/or subject-matter experts interested in improving their career development skills within a structured or unstructured learning environment. The emphasis in this course is on gaining career development techniques and planning formal and informal career development strategies for the individual or the organization. (Typically offered: Spring)

HRWD 5133. HRWD Diversity Issues. 3 Hours.

This course emphasis is on current trends and case studies of diversity in the workplace. Prerequisite: Graduate standing. (Typically offered: Fall)

HRWD 5213. Organizational Analysis. 3 Hours.

This course introduces the analysis process in organizations. The instruction and activities will enable students to develop skills in conducting organizational needs analysis (OA) as a basis for performance improvement in the workplace. (Typically offered: Spring and Summer)

HRWD 5223. Strategic Human Resource and Workforce Development Education. 3 Hours.

A comprehensive examination of the issues, topics, principles, theories, philosophies and concepts facing tomorrow's HRD professionals. Includes the transformation of strategic HRD; the role of strategic HRD leaders as change agents; the principles of strategic HRD; professional practice do mains of strategic HRD; organizational learning, performance, and change; and analysis, design, and evaluation of HPI interventions. Students will identify practices for informing decisions related to the formation of strategic HRD planning and implementation efforts. (Typically offered: Fall)

HRWD 5233. HRWD Employment, Legal, and Ethical Issues. 3 Hours.

This course focuses on employment, legal and ethical issues within the workplace. Students will gain knowledge that should enable them to be effective in understanding current employment concerns, equal employment opportunity (EEO) laws, and ethical practices within the workplace and how these employment concerns, laws, and practices impact society. (Typically offered: Spring)

HRWD 5313. Facilitating Learning in the Workplace. 3 Hours.

Facilitation of learning and performance improvement in the workplace. Application of instructional methods, formal and informal learning strategies, coaching, team building, and formal and informal on-the-job learning tactics. Focus on facilitating individual and group learning to affect organizational change. (Typically offered: Spring)

HRWD 5323. International HRWD. 3 Hours.

Exploration of how globalization and culture affect the workplace and the human resource development profession. Difference between global HRD and HRD practiced in a single country. Impact of culture on every aspect of HRD implementation and practice. Examination of HRD practices in different regions of the world. (Typically offered: Fall)

HRWD 5333. HRWD Technological Resources. 3 Hours.

This course provides students with the tools and abilities to evaluate and understand technology resources used in HRWD. Primary course elements are instructional design characteristics of technology, theoretical and practical uses of technology resources to facilitate and manage learning, and selecting the best or most appropriate technological resources. The course uses online technologies and learning experiences. (Typically offered: Fall)

HRWD 5433. HRWD Capstone. 3 Hours.

This course is the final course for the degree in Human Resource and Workforce Development. Students will be assessed on their overall knowledge and understanding of the field. The focus of this course will be research and analysis of classic works and current trends. Pre- or Corequisite: 27 MED credit hours completed. (Typically offered: Fall, Spring and Summer)

HRWD 571V. Independent Study. 1-3 Hour.

Independent study. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HRWD 572V. Workshop. 1-3 Hour.

Workshop. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

HRWD 573V. Experiential Learning. 1-18 Hour.

This course is designed for the student to attain paid or unpaid experiential development. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

HRWD 6313. Project and Program Evaluation. 3 Hours.

This course is a doctoral level course designed as an introduction to project and program evaluation in human resource and workforce development. Emphasis is on (a) project design and development, (b) program development and improvement, and (c) the integration of evaluation with strategic planning and performance improvement. (Typically offered: Spring Even Years)

HRWD 6323. Qualitative Research Design and Analysis. 3 Hours.

This course is designed to introduce HRWD students to qualitative research design, data collection and data analysis. Course content includes data collection through interviews, field observation, records research, ethical issues associated with conducting research in organizational settings, and internal and external validity problems. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Spring Even Years)

HRWD 6333. Quantitative Research Design and Analysis. 3 Hours.

This course provides HRWD students with the tools and abilities to design and implement an original research project using quantitative measures. Primary course elements are research design application, theoretical settings of research, and nesting research within an appropriate literature base. The course uses online technologies and on-campus learning experiences. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Fall Even Years)

HRWD 6343. Principles and Techniques of Research in HRWD. 3 Hours.

This course addresses the principles and techniques underlying organizational research, both experimental and non-experimental. It covers the basic philosophy of science and research methods and gives attention to the practical problems of design, data collection sampling, and data analysis. Prerequisite: ESRM 5013 and ESRM 6403. (Typically offered: Fall Even Years)

HRWD 6413. Career Theory and Decision Making. 3 Hours.

This course focuses on comprehensive understanding of career theory and decision making to enhance career development that emphasizes technology, cross-cultural issues, practical application, and the global economy. Career development in both the private and public sectors will be explored. Students will gain knowledge that should enable them to be effective in developing their careers and those of others using multicultural considerations and a global perspective. (Typically offered: Fall)

HRWD 6423. Practicum. 3 Hours.

Practicum is designed to allow doctoral students in workforce development education an opportunity to apply the theoretical knowledge, skills and abilities to training, teaching, or research projects. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

HRWD 6513. Organization Development. 3 Hours.

This course teaches development of organization activities that intervene in the interaction of people systems to increase the effectiveness of using a variety of applied behavioral sciences. It includes the dynamics of organizations, the genesis of organizational theory and evolution of organizational dynamics, including examination of system structure, chaos theory, group dynamics and interaction, leadership theories, diversity issues impacting organizations, and techniques of change agent intervention. (Typically offered: Summer Odd Years)

HRWD 6523. Leadership Models and Concepts. 3 Hours.

This doctoral course concentrates on using commonly accepted principles of leadership to develop skills needed in workforce development education settings. (Typically offered: Fall Odd Years)

HRWD 6533. HRWD Ethical and Legal Issues. 3 Hours.

Focuses on ethical and legal issues within the workplace and behavioral science research. Students gain knowledge that should enable them to be effective in understanding ethical and legal issues within their workplace and how they can impact society. (Typically offered: Fall)

HRWD 6613. Learning and Teaching Theories. 3 Hours.

Models and philosophies of important theorists in the field of teaching and learning. (Typically offered: Spring Odd Years)

HRWD 6633. Technology Systems in Human Resource and Workforce Development. 3 Hours.

This course provides students with the tools and abilities to evaluate and understand technology systems in HRWD. Primary course elements are instructional design characteristics of technology systems, theoretical and practical settings that use technology systems to facilitate and manage learning, and selecting the best or most appropriate system for organizational use. The course uses online technologies and learning experiences. (Typically offered: Fall Odd Years)

HRWD 6643. History and Foundations of HRWD. 3 Hours.

This course focuses on the history of human resource development as a practice and a profession. Particular emphasis in this course is placed on the influence of philosophy on developing HRD theory and practice. As students progress through this course they can expect to gain greater understanding of how HRD developed as a profession, the historical root of its theory and practice, and an understanding of how to evaluate the philosophical assumptions of current HRD theory and practice. (Typically offered: Fall Even Years)

HRWD 6713. HRWD Curriculum Design. 3 Hours.

Determining principles of curriculum development, implementation, and evaluation with emphasis in human resource development education. (Typically offered: Summer)

HRWD 6723. Entrepreneurial Development. 3 Hours.

An advanced graduate-level course examining the history, economics, theory and practice of developing Entrepreneurial enterprises. This course presents an overview of the business and organizational systems with which an entrepreneur should be familiar. (Typically offered: Irregular)

HRWD 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Industrial Engineering (INEG) Courses

INEG 513V. Master's Research Project and Report. 1-6 Hour.

Required course for students electing the report option. (Typically offered: Fall, Spring and Summer)

INEG 514V. Special Topics in Industrial Engineering. 1-3 Hour.

Consideration of current industrial engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

INEG 515V. Individual Study in Industrial Engineering. 1-3 Hour.

Opportunity for individual study of advanced subjects related to a graduate industrial engineering program to suit individual requirements. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

INEG 5163. Introduction to Modern Statistical Techniques for Industrial Applications. 3 Hours.

This application-oriented course is driven by real problems arising from industry and focuses on problem solving using both modern and classic statistical methods. For both senior undergraduate and graduate students, the main goal of this course is to provide a comprehensive introduction to those most popular statistical learning methods and tools (such as R and Apache Spark) which are widely used in industry today. For graduate students, this course will also cover the fundamental theory behind some of the methodologies. Students will not receive graduate degree credit for both INEG 410V with the same title, and INEG 5163. (Typically offered: Spring)

INEG 5243. Automated Manufacturing. 3 Hours.

Introduction to manufacturing processes and concurrent engineering in the electronics industry. Survey of electronics components and products and the processes of fabrication and assembly. Principles of design, productivity, quality, and economics. Emphasis on manufacturability. (Typically offered: Irregular)

INEG 5253. Leadership Principles and Practices. 3 Hours.

The course is designed to expose students to multiple approaches to leadership in a wide variety of settings. Leadership styles, the knowledge areas and competencies expected of today's leaders, the challenges leaders face, the historical and philosophical foundations of leadership, the relationships among leadership theory, leadership practice, and the moral-ethical aspects of leadership are among the topics covered in the course. A number of respected regional, national, and international leaders share 'lessons learned' in their leadership journeys. Plus, a number of highly regarded leadership books and case studies on leadership are read and discussed. Students may not receive credit for INEG 4253 and INEG 5253/OMGT 5253. (Typically offered: Fall)
This course is cross-listed with OMT 5253.

INEG 5263. Engineering Statistics. 3 Hours.

A graduate level engineering statistics course covering functions of random variables, properties and distributions of random samples, theory of statistical inference, and rationales of testing hypotheses and constructing confidence intervals. Prior knowledge of material equivalent to MATH 2574 and INEG 2333 is expected. (Typically offered: Fall)

INEG 5313. Engineering Applications of Probability Theory. 3 Hours.

Introduction to probability, discrete random variables, continuous random variables, multiple random variables, sequences of Bernoulli trials. Applications of these topics from inventory, reliability, quality control. (Typically offered: Fall)

INEG 5323. Engineering Applications of Stochastic Processes. 3 Hours.

Renewal processes, Poisson processes, discrete-time Markov chains, continuous-time Markov chains. Applications of these topics from inventory, reliability, quality control, queueing. (Typically offered: Spring)

INEG 5333. Design of Industrial Experiments. 3 Hours.

Statistical analysis as applied to problems and experiments in engineering and industrial research; experiment design and analysis; probability; and response surface analysis. (Typically offered: Irregular)

INEG 5373. Repairable Systems Modeling. 3 Hours.

Applications of probability, statistics, simulation and optimization to problems related to 1) modeling the performance of repairable equipment; 2) designing optimal inspection and maintenance policies for repairable equipment; and 3) optimizing the allocation of maintenance resources. (Typically offered: Irregular)

INEG 5393. Applied Regression Analysis for Engineers. 3 Hours.

Present concepts and applications to introduce statistical tools for discovering relationships among variables. Focus on fitting and checking linear and nonlinear regression models. Practical tools for engineers. (Typically offered: Irregular)

INEG 5423. Advanced Engineering Economy. 3 Hours.

(Formerly INEG 4423.) Preparation of feasibility studies, including cost estimation, risk and uncertainty, sensitivity analysis and decision making. Effects of taxes, depreciation and financing costs on cash flows. Graduate degree credit will not be given for both INEG 4423 and INEG 5423. (Typically offered: Irregular)

INEG 5433. Cost Estimation Models. 3 Hours.

Overview of cost estimation techniques and methodologies applied to manufacturing and service organizations. Accomplished through detailed analysis of the cost estimation development process and various cost estimation models. Topics include data collection and management, learning curves, activity based costing, detailed and parametric estimation models, and handling risk and uncertainty. (Typically offered: Irregular)
This course is cross-listed with OMT 5433.

INEG 5443. Decision Models. 3 Hours.

Focus on quantitative decision models for technical and managerial problems for private and public organizations. Topics include shareholder value, stakeholder value, Value-Focused Thinking, axioms of decision analysis, decision making challenges, decision traps, cognitive biases, decision processes, decision framing, influence diagrams, value hierarchy structuring, designing creative alternatives, single objective models, multiobjective additive value model, swing weights, sensitivity analysis, portfolio decision models with binary linear programming, probability elicitation, Bayes Law, decision trees, Monte Carlo simulation, expected value, dominance (deterministic and stochastic), tornado diagrams, value of information, risk preference, utility models, expected utility, and communicating analysis insights. (Typically offered: Irregular)
This course is cross-listed with OMT 5443.

INEG 5453. Systems Engineering and Management. 3 Hours.

(Formerly INEG 4433.) Overview of the fundamental concepts underlying the management of engineering. Reviews the engineering decision process within the life cycle. Examines implementation of basic management functions in technical organizations and development of strategy tools within a complex organization. Graduate degree credit will not be given for both INEG 4433 and INEG 5453. (Typically offered: Fall)

INEG 5463. Project Management. 3 Hours.

(Formerly INEG 4443.) Analysis of the strategic level of project management including planning, organizing, and staffing for successful project execution. Professional creativity, motivation, leadership, and ethics are also explored. At the tactical level, project selection, control, and systems management are analyzed. Systems development and decision support tools for project management are studied. Graduate degree credit will not be given for both INEG 4443 and INEG 5463. (Typically offered: Irregular)

INEG 5533. Network Optimization in Transportation Logistics. 3 Hours.

Focus on quantitative modeling and analysis of network optimization problems and their application in logistics system design and operation. Topics include network design and routing and location analysis, with emphasis on the application of both exact and heuristic solution techniques for large-scale instances of such problems. Prerequisite: INEG 5613. (Typically offered: Spring)

INEG 5563. Industrial Robotics. 3 Hours.

An interdisciplinary treatment of industrial robotics; manipulator anatomy, control, and programming; end-of arm tooling; sensors & sensing; system integration and safety; current research topics. Graduate-level lab assignments and examinations. Significant literature review and writing assignments. Not open to students with credit for INEG 4563. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall)

INEG 5613. Introduction to Optimization Theory. 3 Hours.

A graduate level introduction to the foundational rationales of numerical optimization methods including linear programming, integer programming, network flows, and discrete dynamic programming. Model formulation and tractability, search strategies, characterization of optimal solutions, duality and sensitivity, outcome justification. Prerequisite: Graduate standing. (Typically offered: Fall)

INEG 5623. Analysis of Inventory Systems. 3 Hours.

Elements of production and inventory control, economic lot size models, price breaks models using Lagrangian method, deterministic dynamic inventory model, probabilistic one-period and multi-period models, zero and positive lead time models, and continuous review models. Prerequisite: INEG 5313. (Typically offered: Irregular)

INEG 5683. Nonlinear Programming. 3 Hours.

An introduction to the theory and methodology of nonlinear programming. Focus on engineering and management science applications of nonlinear optimization. Both single and multi-variable as well as unconstrained and constrained problems are addressed. (Typically offered: Irregular)

INEG 5693. Heuristic Optimization. 3 Hours.

Theory and applications of methodological approaches explicitly addressed to heuristic or approximate optimization of integer and combinatorial models. Prerequisite: INEG 5613. (Typically offered: Irregular)

INEG 5803. Simulation. 3 Hours.

The development and use of discrete-event simulation models for the analysis and design of systems found in manufacturing, distribution, and service contexts. Coverage includes conceptual modeling, model translation to computer form, statistical input models, random number generation and Monte Carlo methods, experimentation and statistical output analysis, and queuing analysis. Includes the use of modern computer simulation languages. Cannot receive credit for both INEG 3623 and INEG 5803. Corequisite: Drill component. (Typically offered: Irregular)

INEG 5813. Introduction to Simulation. 3 Hours.

Development and use of discrete-event simulation models for the analysis and design of systems found in manufacturing, distribution, and service contexts. Coverage includes conceptual modeling, model translation to computer form, statistical input models, random number generation and Monte Carlo methods, experimentation and statistical output analysis, and queuing analysis. For off-campus, distance education students only. (Typically offered: Irregular)

INEG 5823. Systems Simulation I. 3 Hours.

Random number generation, random variate generation, timekeeping in simulations, discrete event modeling, construction of digital simulation models, statistical analysis of simulation results, and analysis of simulation experiments utilizing a computer programming language. (Typically offered: Irregular)

INEG 5833. Introduction to Database Concepts for Industrial Engineers. 3 Hours.

(Formerly INEG 4833.) An introduction to the basic principles of database modeling and technologies for industrial engineers. Coverage includes analyzing user requirements, representing data using conceptual modeling techniques (e.g. UML, ERD), converting conceptual models to relational implementations via database design methodologies, extracting data via structured query language processing, and understanding the role of database technology in industrial engineering application areas such as inventory systems, manufacturing control, etc. The application of a desktop database application such as Access will be emphasized. Graduate degree credit will not be given for both INEG 4833 and INEG 5833. (Typically offered: Irregular)

INEG 600V. Master's Thesis. 1-9 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

INEG 6113. Linear Optimization. 3 Hours.

A precise treatment of linear programming. Theory of convex sets, linear inequalities; development of the simplex method; duality theory; post optimality application and interpretation. Variants of the simplex methods and interior-point algorithms are discussed. Prerequisite: INEG 5613. (Typically offered: Fall)

INEG 614V. Special Topics for Doctoral Students in Industrial Engineering. 1-3 Hour.

Consideration of current industrial engineering topics at the doctoral level that are not covered in other courses. Prerequisite: PhD student in Industrial Engineering or consent of the instructor. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

INEG 6213. Integer Programming. 3 Hours.

This course offers the theory needed to model and efficiently solve large-scale binary, mixed and general integer programs. The tools needed to assess the computational complexity of these problems will be fully studied. Additional topics include the conceptual foundation required for the development of cutting plane, branch-and-price, Lagrange relaxation and constraint programming approaches. Implementation considerations specific to preprocessing, valid inequality generation and solution methodology convergence will be emphasized. Prerequisite: INEG 6113. (Typically offered: Spring)

INEG 6313. Network Optimization. 3 Hours.

A theorem/proof based advanced study providing rigorous exposition of foundational network optimization concepts including relevant optimization theory, algorithm development techniques, complexity analysis, data structures, and important applications. Prerequisite: INEG 6113. (Typically offered: Fall)

INEG 6323. Advanced Stochastic Processes. 3 Hours.

This course prepares Ph.D. students with advanced topics in probability and stochastic processes, with a focus on deriving and analyzing probability and stochastic models, and theorem proving in related topics. Contents include review of probability theorems, limit and convergence theorems, generating functions, Poisson processes, renewal theory, discrete and continuous Markov chains, and other advance topics. Prerequisite: INEG 5313 and INEG 5323. (Typically offered: Spring)

INEG 6363. Generalized Linear Models. 3 Hours.

Introduce the generalized linear model (GLM), inference, likelihood and diagnostics. Apply log linear and logistic models. Develop techniques for growth curves, and longitudinal and survival data. Cover spatial and normal linear models, and dynamic GLM for dependent data. (Typically offered: Irregular)

INEG 6443. Advanced Decision Analysis. 3 Hours.

The purpose of this course is to prepare the student to perform PhD and MS level research and analysis using advanced decision analysis concepts and techniques. The course topics include the history of decision analysis, foundations of decision analysis, structuring decision problems, assessing probabilities, probability management, Bayesian networks, utility, risk preference, risk analysis for engineering applications, intelligent adversary risk analysis, behavioral and organizational context for decision analysis, and major decision analysis applications. Prerequisite: INEG 5443. (Typically offered: Spring)

INEG 6823. Systems Simulation II. 3 Hours.

Advanced topics in computer simulation including experimental design, simulation optimization, variance reduction, and statistical output analysis techniques applied to discrete event simulation. Prerequisite: INEG 5823. (Typically offered: Irregular)

INEG 6843. Scheduling Theory and Algorithms. 3 Hours.

The course will cover the theory and solution methods for scheduling several tasks over time. Topics include terminology, measures of performance, single machine sequencing, flow shop scheduling, the job shop problem, and priority dispatching. Side constraints within scheduling, such as precedence, release dates, and due dates are addressed. Integer programming, dynamic programming, and heuristic approaches to various problems are also presented. Prerequisite: INEG 5613 or equivalent, computer programming proficiency, and exposure to proofs. (Typically offered: Irregular)

INEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Information Systems (ISYS)

Courses

ISYS 5103. Data Analytics Fundamentals. 3 Hours.

Fundamental knowledge and skills in several major areas of business data analytics. Emphasis on the management and use of data in modern organizations, intermediate & advanced spreadsheet topics; relational databases & SQL; and programming (such as Python). Prerequisite: MIS Director approval. (Typically offered: Fall)

ISYS 511V. IT Toolkit & Skills Seminar. 1-3 Hour.

Seminar in Information Systems solutions and concepts (such as applications development, VB.NET, analysis of problems and design of solutions via application systems, etc.) designed for students entering the MIS program--may not be used for MIS degree credit. Prerequisite: MIS Director approval. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

ISYS 5133. Blockchain and E Business Development. 3 Hours.

This course explores various blockchain and e-business development technologies and then utilizes these technologies for developing a realistic application. Students will also learn strategies and use a varied web stack to build web pages that interact with blockchain platforms. Pre- or corequisite: ISYS 5173. (Typically offered: Fall)

ISYS 516V. Independent Study. 1-3 Hour.

(Formerly ISYS 450V.) Permits students on individual basis to explore selected topics in data processing and/or Quantitative Analysis. Graduate degree credit will not be given for both ISYS 450V and ISYS 516V. (Typically offered: Fall and Spring)

ISYS 5173. Blockchain Fundamentals. 3 Hours.

This course provides the fundamental concepts underpinning blockchain technologies. The focus is on blockchain applications for business. Students will learn about the overall blockchain landscape, including investments, the size of markets, major players and the global reach, as well as the potential business value of blockchain applications and the challenges that must be overcome to achieve that value. Students will learn enough about the underlying technologies to speak intelligently to technology experts and will be well-prepared to develop blockchain applications in future courses. Prerequisite: Graduate standing and departmental consent. (Typically offered: Fall, Spring and Summer)

ISYS 5203. Experimental Design. 3 Hours.

ANOVA, experimental design, introduction to basis of statistics. Prerequisite: Graduate standing and WCOB 1033 or equivalent. (Typically offered: Fall)

ISYS 5213. ERP Fundamentals. 3 Hours.

An introduction to enterprise resource planning systems. Students should gain an understanding of the scope of these integrated systems that reach across organizational boundaries and can change how a company does business. Implementation issues are covered, including the importance of change management. Prerequisite: Graduate standing. (Typically offered: Fall and Summer)

ISYS 5223. ERP Configuration and Implementation. 3 Hours.

The process of configuring and implementing an enterprise resource planning system. Business process analysis and integration. Students will develop a company and set up several modules in SAP for use. Develop understanding of how the business processes work and integrate. Prerequisite: ISYS 5213 or equivalent. (Typically offered: Fall and Spring)

ISYS 5233. Seminar in ERP Development. 3 Hours.

ERP administration and system development practices. Advanced system support issues related to Enterprise Resource Planning systems that are used in global organizations. Basic ABAP programming. In addition, students will learn how to provide basic systems administration support of the operating system, database, and application systems software levels of ERP systems. Pre- or Corequisite: ISYS 5223. Prerequisite: ISYS 5213. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

ISYS 5243. Current Topics in Computer Information. 3 Hours.

(Formerly ISYS 4243.) Intensive investigation of selected developments in computer information systems hardware, software, and organization having current impact on computer information systems design and application. Offering an extension of lower-level CIS courses through individual student research and faculty team-teaching of advanced topics. Topical selection made with each course offering. Graduate degree credit will not be given for both ISYS 4243 and ISYS 5243. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ISYS 535V. Internship Experience. 1-6 Hour.

This course allows a student to experience an internship within a business and benefit from the work experience. The internship focuses on applications and business problems and is supervised by a faculty member as well as a member of the company/firm. Prerequisite: MIS Director approval is required. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ISYS 5363. Business Analytics. 3 Hours.

This course in managerial business analytics provides future managers with the key concepts of decision modeling and information technology management concepts. Students will learn to utilize real time operational business data, as well as quickly process and effectively leverage information. In addition, students will exercise strategic IT deployment skills for supply chain and marketing processes as well as develop strong decision modeling abilities. (Typically offered: Spring)

ISYS 5373. Application Development with Java. 3 Hours.

(Formerly ISYS 4373.) This course covers object-oriented programming concepts and illustrates them via an appropriate object-oriented programming language. Students will be exposed to the design of software objects, creation of software objects, and the use of objects in constructing an information system. Graduate degree credit will not be given for both ISYS 4373 and ISYS 5373. Prerequisite: ISYS 3293 with a grade of C or better. (Typically offered: Fall)

ISYS 5403. Quantitative Methods and Decision Making. 3 Hours.

Utilization of information, quantitative techniques, and computer application in decision making and problem solving for managers. (Typically offered: Irregular) This course is cross-listed with SCMT 5133.

ISYS 5423. Seminar in Systems Development. 3 Hours.

Advanced study of structured systems development. Emphasis on strategies and techniques of structured analysis and structured design for producing logical systems specifications and for deriving physical systems designs. Coverage of methodologies for dealing with complexity in the development of information systems. Prerequisite: ISYS 511V. (Typically offered: Fall)

ISYS 5433. Enterprise Systems. 3 Hours.

Enterprise Systems comprises the entire class of information technology and systems that support the mission of the company including decision support and business processes. This managerial enterprise systems course focuses on strategic issues of information technology. Students study the various elements and integration of an organization's business processes; as a result, students gain an understanding and working knowledge of systems used to support these business processes and their use in decision making. In addition, students will study concepts and develop skills needed to utilize decision-centric business intelligence and knowledge management applications. (Typically offered: Spring)

ISYS 5453. Blockchain and Enterprise Data. 3 Hours.

The focus of this course is to expose students to working with distributed and service oriented architectures for different applications as well as the IT infrastructure needed. The course provides the opportunity for students to gain valuable insight into blockchain as a distributed system and cloud architecture platforms with the goal of developing enterprise applications. Prerequisite: ISYS 5133. (Typically offered: Spring)

ISYS 5463. Enterprise Transaction Systems. 3 Hours.

Being able to accurately capture and store business transactions is an important processing function in many businesses. For many large companies with high volume processing, the tools of choice for transaction processing are applied. This course provides students with the necessary understanding and skills to develop advanced applications in mainframe environment. Pre- or Corequisite: ISYS 5453 or equivalent or MIS Director approval. (Typically offered: Irregular)

ISYS 5503. Decision Support and Analytics. 3 Hours.

Analysis of the highest level of information support for the manager-user. A study of systems providing analytics-based information derived from databases within and/or external to the organization and used to support management in the decision making. Application of tools in business analytics, problem solving, and decision making. Prerequisite: MIS Director approval. (Typically offered: Fall)

ISYS 5603. Analytics and Visualization. 3 Hours.

This course focuses on how to discern and tell your story visually using data based on traditional graphical data representation as well as the latest data and information technologies. Coverage includes both visualization theory and hands-on exercises using appropriate computing tools. The course will also include visualization of predictive, clustering, and association models. The opportunities and challenges of Big Data visualization will be explored. Corequisite: Lab component. Prerequisite: (ISYS 5503) or (ISYS 5133 and departmental consent). (Typically offered: Fall)

ISYS 5713. Seminar in IS Topics. 3 Hours.

Intensive seminar in selected information systems topics. Topical selection made with each course offering. Prerequisite: ISYS 511V or MIS Director approval. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

ISYS 5723. Advanced Multivariate Analysis. 3 Hours.

Factor analysis and other advanced techniques. Prerequisite: ISYS 5623. (Typically offered: Irregular)

ISYS 5833. Data Management Systems. 3 Hours.

Investigation and application of advanced database concepts include database administration, database technology, and selection and acquisition of database management systems. Data modeling and system development in a database environment. Prerequisite: ISYS 5103. (Typically offered: Spring)

ISYS 5843. Seminar in Business Intelligence and Knowledge Management. 3 Hours.

Business intelligence focuses on assessing and creating information and knowledge from internal and external sources to support business decision making process. In this seminar, data mining and information retrieval techniques will be used to extract useful knowledge from data, which could be used for business intelligence, and knowledge management. Pre- or Corequisite: ISYS 5833 or equivalent. Prerequisite: ISYS 5503 or equivalent. (Typically offered: Spring)

ISYS 593V. Global Technology and Analytics Seminar. 1-3 Hour.

This course is designed to provide an updated, comprehensive, and rigorous treatment of emerging global topics. Includes, but is not limited to, global study experiences, business insights, and foundational perspectives; examines significant issues from global perspectives. Prerequisite: Department Consent, Graduate standing, and MIS Director approval. (Typically offered: Summer) May be repeated for up to 3 hours of degree credit.

ISYS 5943. Management of Information Technology Seminar. 3 Hours.

Presented in a way that allows you to play an active role in the design, use, and management of information technology. Using IT to transform the organization, as competitive strategy, and creating new relationship with other firms is included. Pre- or Corequisite: ISYS 5833. Prerequisite: ISYS 5423. (Typically offered: Spring)

ISYS 599V. Practicum Seminar. 1-6 Hour.

This course is designed to introduce and engage the student in the practice, application, and problem solving in the business environment. Hands-on application of a business problem. Students will gain experience working on, making decisions about, and developing solutions for business applications. Topics include but not limited to analytics, data, and information technology. Prerequisite: Graduate standing and MIS Director approval. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

ISYS 601V. Graduate Colloquium. 1-6 Hour.

Presentation and critique of research papers and proposals. (Typically offered: Fall and Spring)

ISYS 6133. Survey of IS Research. 3 Hours.

This is an introductory seminar in information systems research for doctoral students. Its objective is to introduce participants to major streams of IS research and discuss many of the important roles and responsibilities of an IS researcher. Also, this course will play the important role of introducing participants to the research of the current IS faculty. (Typically offered: Fall)

ISYS 6333. Individual-level Research in IS. 3 Hours.

This course aims to expose students to individual-level research in IS. It provides a window into major streams of individual-level research in IS and reference disciplines. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

ISYS 636V. Special Problems. 1-6 Hour.

Independent reading and research under supervision of senior staff member. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

ISYS 6533. Macro- and Meso-level IS Research. 3 Hours.

This course aims to expose students to research at the macro- and meso-levels. For example, it could provide a window into major streams of organizational-level research in IS and reference disciplines. Topics could also include: change management, ERP research models, implementation, applications, and successes/failures, and ERP simulation models. Other topics that fall within the purview of the course are: large-scale technology and process innovations in organizations--e.g., software development process innovations and RFID will be examined at various levels (e.g., organizational). (Typically offered: Irregular)

ISYS 6633. Systems Development. 3 Hours.

The course provides an in-depth study of systems development as an area of research, understanding of the theoretical and conceptual foundations, insight into the current state of the research area, utilizes both IS and reference discipline literature as appropriate, guidance for conducting research projects and producing publishable research, an opportunity to work on cutting-edge research. (Typically offered: Irregular)

ISYS 6733. Emerging Topics. 3 Hours.

Various emerging topics, such as RFID applications and RFID supply chain, ethical decision models, behavioral modeling, piracy and privacy issues, and virtual worlds. (Typically offered: Irregular) May be repeated for up to 15 hours of degree credit.

ISYS 6833. Theory Development. 3 Hours.

To acquire theory development and writing skills, to understand challenges in developing and writing theory sections of papers, and to discuss approaches to writing good empirical journal articles. This course is suited for all social sciences students and is particularly appropriate for students conducting behavioral research in the business disciplines. (Typically offered: Irregular)

ISYS 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Japanese (JAPN) Courses

JAPN 5313. Language and Society of Japan. 3 Hours.

(Formerly JAPN 4313.) The primary objective of this course is to investigate the way the Japanese language reflects the beliefs and custom of the Japanese people as a social group. For comparison purposes, this course makes reference to studies in American language and culture. Proficiency in Japanese not required. Graduate degree credit will not be given for both JAPN 4313 and JAPN 5313. (Typically offered: Fall)

JAPN 5333. Professional Japanese I: Business Writing. 3 Hours.

(Formerly JAPN 4333.) This course aims to familiarize the students with formats, vocabulary, and expressions in Japanese business correspondence. Emphasizes career-ready Japanese language proficiency. Graduate degree credit will not be given for both JAPN 4333 and JAPN 5333. Prerequisite: JAPN 3116 or equivalent Japanese proficiency. (Typically offered: Spring)

Journalism (JOUR) Courses

JOUR 5003. Advanced Reporting. 3 Hours.

Stresses public affairs coverage, interpretive, investigative, and analytic journalism, involving research, work with documents, public records, and budgets and specialized reporting. (Typically offered: Irregular)

JOUR 5013. Advanced Radio News Reporting. 3 Hours.

(Formerly JOUR 4033.) Intensive training in the production of in-depth, public radio style news stories. Graduate degree credit will not be given for both JOUR 4033 and JOUR 5013. Prerequisite: JOUR 2032 and JOUR 2031L, each with a grade of C or better. (Typically offered: Spring)

JOUR 5023. Journalism Theory. 3 Hours.

Examination of the major journalism and mass media theories and conceptual perspectives regarding journalism, news, mass media, advertising and public relations relevant to industry and academic researchers and professionals. (Typically offered: Fall)

JOUR 5043. Research Methods in Journalism. 3 Hours.

Research methods of utility in journalism. Emphasis on survey research, electronic data base searching, and traditional library research. Prerequisite: Graduate standing or honors program standing. (Typically offered: Spring)

JOUR 5063. Issues in Advertising and Public Relations. 3 Hours.

Seminar course involving the critical examination of the major cultural, social, political, economic, ethical, and persuasion theories and/or issues relevant to advertising and public relations affecting individuals, organizations, societies. Prerequisite: Graduate standing. (Typically offered: Fall)

JOUR 508V. Graduate Journalism Internship. 1-3 Hour.

Credit for practical experience gained through a journalistic internship. Must have completed 6 hours of graduate course credit. May be repeated for up to 3 hours of degree credit. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

JOUR 5093. Business Journalism. 3 Hours.

Examines how the U.S. economy works and how to find news in business, market and government data sources. Focuses on the role of corporations, financial markets, and regulators, and benefiting students interested in sports, entertainment, political and investigative journalism. (Typically offered: Spring)

JOUR 5133. Ethics in Journalism. 3 Hours.

A seminar examining the professional ethical principles and ethical performance in the journalism field. The ethical performance of the mass media dedicated to news, public relations and advertising is evaluated based on ethical theories and industry standards. Prerequisite: Graduate standing. (Typically offered: Fall)

JOUR 5163. Computer-Assisted Publishing. 3 Hours.

(Formerly JOUR 4063.) In-depth, hands-on exploration of computer hardware and software in the design and production of media messages. Examination of developing media technologies and the computer's influence on design and conceptualization. Graduate degree credit will not be given for both JOUR 4063 and JOUR 5163. (Typically offered: Irregular)

JOUR 5173. Social Media and Journalism. 3 Hours.

(Formerly JOUR 4073.) Social Media and Journalism teaches conceptual knowledge and skills to develop news judgment and use changing technological tools to disseminate news quickly and to different audiences. The value of interacting with sources and the audience is stressed as are ethical, legal and accuracy issues. Graduate degree credit will not be given for both JOUR 4073 and JOUR 5173. Prerequisite: JOUR 2013 or JOUR 2032 with a grade of C or better. (Typically offered: Fall)

JOUR 5193. Professional Journalism Seminar. 3 Hours.

Examination of complex problems encountered by professional journalists with focus on research and analysis of the role of journalism in major social, economic, and political developments. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

JOUR 5283. Data Journalism. 3 Hours.

Provides an in-depth experience of combining street reporting and data analysis to tell a story of significant societal importance. Students are introduced to techniques in data analysis, management, visualization and production of data-driven articles and and multimedia presentations. Prerequisite: Instructor permission. (Typically offered: Fall)

JOUR 5313. Literature of Journalism. 3 Hours.

A study of superior works of non-fiction journalism, past and present. Includes authors from Daniel Defoe to John McPhee. (Typically offered: Irregular)

JOUR 5323. Documentary Production I. 3 Hours.

In-depth study of documentary film as non-fiction, long form journalism. Covers subject, funding, research and development, pre-production planning, field production, talent, music, post production, promotion, broadcast and distribution. Required trip to Hot Springs Documentary Film Festival. (Typically offered: Fall)

JOUR 5333. Documentary Production II. 3 Hours.

A continuation of JOUR 5323, Documentary Production I. Students photograph, write, and edit a documentary begun in the fall semester. Prerequisite: JOUR 5323. (Typically offered: Spring)

JOUR 5463. Campaigns. 3 Hours.

(Formerly ADPR 4463.) Applying advertising principles and techniques to preparation of a complete campaign; determining agency responsibilities, marketing objectives and research, media mix, and creative strategy. Emphasis also given to campaign presentation delivery, utilizing audio and visual techniques. Graduate degree credit will not be given for both ADPR 4463 and JOUR 5463. Prerequisite: ADPR 3723 and ADPR 3743, each with a grade of B or better, and 2.5 overall GPA. (Typically offered: Fall, Spring and Summer)

JOUR 5473. Account Planning. 3 Hours.

An introduction to applied advertising research and account planning. Integrate consumers' perspectives into creative strategy to developing brand stories for clients. Write creative briefs, positioning statements and prepare copy-testing research instruments to evaluate messages. Utilize consumer research for creating messages for diverse cultures. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

JOUR 5503. Magazine Writing. 3 Hours.

(Formerly JOUR 4503.) This intensive writing and reporting course is for students with proven feature-writing skills and an interest in the human-interest stories found in such leading magazines as *The New Yorker*, *Esquire*, *Harper's*, *the Atlantic*, and others. Students will compose magazine-length nonfiction stories on timely subjects under deadline. Stories are submitted for contests and publication, when possible. Graduate degree credit will not be given for both JOUR 4503 and JOUR 5503. Prerequisite: JOUR 2013 with a grade of C or better. (Typically offered: Spring)

JOUR 5883. Advanced Television News Production. 3 Hours.

(Formerly JOUR 4883.) Continuation of JOUR 4873. Students prepare and present television newscasts for air. Laboratory component arranged. Graduate degree credit will not be given for both JOUR 4883 and JOUR 5883. Corequisite: Lab component. Prerequisite: JOUR 4873 with a grade of C or better. (Typically offered: Irregular)

JOUR 5903. Community Journalism. 3 Hours.

(Formerly JOUR 4903.) This three-hour course will blend student reporting and editing skills with instruction on how regional newspapers select and present news to a local audience. This course will instruct students in deciding news stories for regional readers, how those stories can best be written and displayed. The semester goal is to publish a paper. Graduate degree credit will not be given for both JOUR 4903 and JOUR 5903. (Typically offered: Spring)

JOUR 5923. History of the Black Press. 3 Hours.

Covers the historic context of contributions and innovations to U.S. newspapers by African Americans. Also investigates the role of the black press from its beginnings in 1827 through the civil rights movement. (Typically offered: Spring Even Years)

JOUR 600V. Master's Thesis. 1-6 Hour.

Required of all M.A. journalism students. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Kinesiology (KINS)

Courses

KINS 5413. Adapted Movement Science. 3 Hours.

Methods and techniques for working with individuals with disabilities in an adapted movement science. (Typically offered: Fall Even Years)

KINS 5423. Assessment and Prescriptive Programming in Adapted Movement Science. 3 Hours.

Instruction in the assessment, prescription, and use of instruction methods, materials, and equipment relevant to working with people with disabilities. (Typically offered: Spring Odd Years)

KINS 5493. Practicum in Adapted Physical Education. 3 Hours.

Deals with the application of skills, knowledge and concepts necessary for planning, organizing and conducting adapted physical education programs through supervised field experiences. (Typically offered: Irregular)

KINS 574V. Internship. 1-6 Hour.

Internship. (Typically offered: Spring) May be repeated for up to 6 hours of degree credit.

KINS 589V. Independent Research. 1-3 Hour.

Development, implementation, and completion of basic or applied research project. Prerequisite: Admission to the master's program in kinesiology or admission to the master's program in athletic training. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

KINS 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

KINS 605V. Independent Study. 1-3 Hour.

Provides students with an opportunity to pursue special study of educational problems. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

KINS 674V. Internship. 1-3 Hour.

Internship. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

Latin (LATN) Courses

LATN 5003. Roman History. 3 Hours.

(Formerly LATN 4003.) Selections from Sallust, Livy, Tacitus, or Suetonius. An overview of Roman Historiography through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4003 and LATN 5003. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular)

LATN 5013. Roman Satire. 3 Hours.

(Formerly LATN 4013.) Selections from the satires of Horace, Juvenal, Persius, or Seneca. An overview of Roman humor and the genre of satire through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4013 and LATN 5013. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular)

LATN 5023. Roman Didactic Epic. 3 Hours.

(Formerly LATN 4023.) Selections from Virgil's *Georgics*, Lucretius' *De Rerum Natura*, or Manilius' *Astronomica*. An overview of Roman philosophical poetry through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4023 and LATN 5023. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular)

LATN 5033. Roman Drama. 3 Hours.

(Formerly LATN 5033.) Selections from Plautus, Terence, or Seneca. An overview of Roman theater through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4033 and LATN 5033. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular)

LATN 5043. Roman Elegy. 3 Hours.

(Formerly LATN 4043.) Selections from Propertius, Tibullus, or Ovid. An overview of the genre through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4043 and LATN 5043. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular)

LATN 5063. Roman Pastoral and Lyric. 3 Hours.

Selections from Catullus, Virgil's *Eclagues*, Horace's *Odes*, or Calpurnius Siculus. An overview of the two genres through the critical study of complete works in translation and secondary works. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

LATN 5073. Roman Novel. 3 Hours.

(Formerly LATN 4073.) Selections from Petronius or Apuleius. An overview of the genre through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4073 and LATN 5073. (Typically offered: Irregular)

LATN 5083. Roman Oratory. 3 Hours.

(Formerly LATN 4083.) Selections from the orations and theoretical works of Cicero, Seneca the Elder, or Quintilian. An overview of the genre through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4083 or LATN 5083. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

LATN 5093. Roman Philosophy. 3 Hours.

(Formerly LATN 4093.) Selections from the philosophical works of Cicero or Seneca. An overview of Roman philosophy through the critical study of complete works in translation and secondary works. Graduate degree credit will not be given for both LATN 4093 and LATN 5093. Prerequisite: LATN 3013 or equivalent. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

LATN 5633. Medieval Latin. 3 Hours.

Selections from medieval writers from the 4th to the 17th century. Prerequisite: LATN 3003 or equivalent. (Typically offered: Irregular)

LATN 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

Management (MGMT)

Courses

MGMT 5213. Business Foundations for Entrepreneurs. 3 Hours.

Introduction to the fundamental business concepts an entrepreneur needs to know to evaluate and launch a successful new venture. Topic areas include recruitment, selection, motivation and management of employees, market analysis and the marketing mix, financial strategies and accounting for funds, economic considerations, and the management of operations. Prerequisite: Graduate standing. (Typically offered: Spring)

MGMT 5223. Business Leadership and Ethics. 3 Hours.

Management for a global environment. The class will cover interpersonal workplace skills such as leadership and motivation, along with the management of human capital through well designed recruitment, selection, performance evaluation, compensation, and quality control systems. (Typically offered: Fall) May be repeated for degree credit.

MGMT 5313. Strategic Management. 3 Hours.

Strategy formulation, strategy implementation, and other topics related to the long-term success of the firm. Includes role of the general manager, international issues, and the impact of management fads on decision making. (Typically offered: Summer)

MGMT 5323. New Venture Development. 3 Hours.

Focuses on the identification and analysis of new venture opportunities and how entrepreneurs acquire the human and financial resources needed to develop successful businesses. Topics include market analysis, development of products and services, negotiation, developing and executing business plans, and new venture financing. Students are required to complete summer assignments before the course begins in the fall semester. Prerequisite: MGMT 5213 or an undergraduate degree in business or permission of the instructor. (Typically offered: Fall)

MGMT 5363. Innovation & Creativity. 3 Hours.

This class will provide a framework for developing, assessing and implementing innovations in start-ups and established businesses. Focus is on creative decision making, managing for innovation, strategic analysis of innovations, and implementation of innovations. Aimed at entrepreneurs, brand managers, and managers in industries where innovation is a key strategic capability. (Typically offered: Spring)

MGMT 537V. Global Business. 1-3 Hour.

Integrated overview of the global business environment and the organizational challenges of a multinational firm. To enhance understanding of the business and cultural environment of prominent emerging markets, the course includes a 2-3 week overseas immersion project to fulfill a predefined goal. Project is integrated with global content upon return. (Typically offered: Summer)
This course is cross-listed with ECON 537V.

MGMT 5391. Business History and Practice. 1 Hour.

This course provides students with an overview of how businesses evolve over the years, and how they are run today. Using examples from research and practitioner articles, it allows students to learn about hands on concepts such as business models, Integrative Performance, Organization Structure, Competitive Advantage, Value Networks, and Business Obligations in an experiential manner. (Typically offered: Fall and Spring)

MGMT 5413. New Venture Development II. 3 Hours.

A large-scale, real world, 10 week project involving hands-on work addressing issues faced by managers in partnering firms. Corequisite: Instructor consent. Prerequisite: MGMT 5323. (Typically offered: Spring)

MGMT 5602. Introduction to Strategy. 2 Hours.

An introduction to the value chain concept, the underlying framework of the Managerial MBA program. Topics include the primary value chain activities of inbound logistics, operations, outbound logistics, marketing and sales, and service, as well as the support activities of procurement, technology development, human resource management and firm infrastructure. (Typically offered: Fall)

MGMT 5613. Leadership and Organizational Behavior. 3 Hours.

Managing in a global workforce, including human resource issues, motivation, performance evaluation, quality concepts, transformational leadership, and selection/recruitment/ development of employees. (Typically offered: Summer)

MGMT 5993. Entrepreneurship Practicum. 3 Hours.

Hands-on management of an actual on-going business. Students will gain experience working in, making decisions about, and managing a competitive business. Students will be required to analyze the business in a term paper or other integrative assignment. Entrance by application only. (Typically offered: Fall, Spring and Summer)

MGMT 6011. Graduate Colloquium. 1 Hour.

Presentation and critique of research papers and proposals. (Typically offered: Fall and Spring) May be repeated for degree credit.

MGMT 6113. Seminar in Organizational Behavior. 3 Hours.

Survey of theoretical and empirical literature in organizational behavior. Stresses critical evaluation of current writing in the field and its integration with prior research. Covers topics relating to motivation, individual differences, job attitudes, social influence processes, and group dynamics. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6123. Seminar in Organization Theory. 3 Hours.

This Ph.D.-level seminar presents an overview and introduction into organization theory literature. Emphasis on the development of relevant schools of thought, changes in the content of the traditional or 'mainstream' themes, current topics, schools of thought, and future directions are examined. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6133. Seminar in Strategy Research. 3 Hours.

This Ph.D.-level seminar presents an overview and introduction into the strategic management literature. Emphasis on both the content and process of the extant research. Relevant theory, methods, 'mainstream' themes, current topics, schools of thought, and future directions are examined. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6213. Seminar in Research Methods. 3 Hours.

Familiarizes students with the principles and techniques underlying research in management and organizations. Issues of basic philosophy of science and research methods are covered. Special attention given to the practical problems of research design, measurement, data collection, sampling, and interpretation in conducting research in management and in organizations. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 6223. Seminar in Management Topics. 3 Hours.

Seminar in special research topics in management. Topics vary depending upon instructor. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MGMT 6233. Seminar in Human Resource Management. 3 Hours.

Provides an overview of major issues in human resource management. Designed to familiarize students with the seminal research in human resource management, and to provide them with the conceptual and methodological tools necessary to do research in the area. Prerequisite: Admission to a Ph.D. program. (Typically offered: Irregular)

MGMT 636V. Special Problems in Management. 1-12 Hour.

Individual reading and research. (Typically offered: Fall and Spring) May be repeated for up to 12 hours of degree credit.

MGMT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Marketing (MKTG) Courses

MKTG 5103. Introduction to Marketing. 3 Hours.

Introduction to marketing concepts and practices as applied to the retail consumer environment. Focuses on the strategic development, positioning, and management of products, promotion, distribution, pricing, and store environments in building customer relationships from retailer and supplier perspectives. (Core) (Typically offered: Fall and Spring) May be repeated for degree credit.

MKTG 5223. Marketing. 3 Hours.

Product management, market research, marketing communications, retailing and distribution, consumer behavior, and social and ethical implications of marketing. (Typically offered: Fall)

MKTG 5333. Retailing Strategy and Processes. 3 Hours.

Strategic planning and operation of retailing organizations. Investigation of the various types of retailing with emphasis on both the strategic and functional aspects in retail processes. (Typically offered: Spring)

MKTG 5433. Consumer and Market Research. 3 Hours.

Modern marketing research methods and analyses applied to consumers, shoppers, and buyers of goods and services sold in competitive retail environments. Attention is given to both quantitative and qualitative methods, analyses, interpretation, and decision making. Prerequisite: MKTG 5103. (Typically offered: Fall)

MKTG 5523. Marketing Analytics. 3 Hours.

This course is intended to teach students how to use data analytics to improve marketing decision making at every stage of the Strategic Marketing Process. The focus will be on the skills and tools needed to obtain, process, and analyze data to formulate and answer critical marketing questions and make managerial recommendations. This is a hands-on course that employs real-world databases, lectures, cases, and exercises. Prerequisite: MKTG 5103. (Typically offered: Spring)

MKTG 5553. New Product Development and Strategy. 3 Hours.

Behavioral and social science concepts applied to retail shoppers, buyers, and consumers of products and services. Attention is given to research on the cognitive, affective, and experiential aspects involved in the acquisition, consumption, and disposal of products and services by individuals and households. Prerequisite: MKTG 5103. (Typically offered: Irregular)

MKTG 5563. Retail Strategy. 3 Hours.

The purpose of this course is to investigate the changing landscape of the retail industry. It should be noted that 'retail' is an incredibly broad topic covering everything from consumer insights to supply chain to sales management. Retail is currently experiencing somewhat of a revolution as companies experiment with new technology, innovative ways to make shopping more enjoyable, or ways of engaging the customer in a way they are not likely to forget. This course will be based on identification and discussion of new trends that emerge in the retail environment. Prerequisite: MKTG 5223. (Typically offered: Spring)

MKTG 636V. Special Problems in Marketing. 1-6 Hour.

Individual research problems. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MKTG 6413. Special Topics in Marketing. 3 Hours.

Seminar in special topics in marketing. Topics vary depending upon the instructor. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MKTG 6433. Seminar in Research Methods. 3 Hours.

Extensive review of literature illustrative of marketing research studies. Focuses upon theoretical foundations of research design, methodology, and analysis as well as interpretation of univariate, bivariate, and multivariate data in marketing theory exploration. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MKTG 6443. Seminar in Marketing Theory. 3 Hours.

Comprehensive survey and critical review of the history of marketing thought and contemporary schools of thought in marketing discipline. In-depth research, review, synthesis, and a research proposal will be required in a selected topic from the perspectives of advancing marketing theory. (Typically offered: Irregular)

MKTG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall and Spring) May be repeated for degree credit.

Master of Business Administration (MBAD) Courses

MBAD 5241. Ethical Decision Making. 1 Hour.

Business Ethics will address business ethics issues from a personal, professional, and organizational perspective. We will cover basic ethical decision-making frameworks to help inform students' personal moral frameworks, ethical issues that are most relevant to managers of modern organizations, and the role of business in society (Typically offered: Fall)

MBAD 535V. MBA Internship. 1-3 Hour.

This course allows a student to experience an internship within a business and benefit from the applied experience. The internship may be designed to offer a wide range of business experiences. The internship must be supervised by a faculty member as well as a member of the firm. MBA Director approval required. (Typically offered: Summer) May be repeated for up to 3 hours of degree credit.

MBAD 5433. Capstone Project. 3 Hours.

A large-scale project integrating various business topics. Prerequisite: MGMT 5313. (Typically offered: Summer)

MBAD 5511. Professional Development -- Special Topics In Business. 1 Hour.

A concentrated emphasis on one business topic. Corequisite: MGMT 5613, ACCT 5263 and ECON 5253. (Typically offered: Fall and Spring) May be repeated for up to 5 hours of degree credit.

Mathematics (MATH)

Courses

MATH 5013. Abstract Algebra with Connections to School Mathematics. 3 Hours.

Basic structures of abstract algebra (rings, fields, groups, modules and vector spaces) with emphasis on rings and fields as generalizations of the ring of integers and field of rational numbers. Graduate degree credit will not be awarded for both MATH 4113 (or MATH 5123) and MATH 5013. Prerequisite: Graduate standing or departmental consent. (Typically offered: Irregular)

MATH 5023. Geometry with Connections to School Mathematics. 3 Hours.

School geometry from an advanced perspective including conformity to the Common Core State Standards for Mathematics. Study will include historical developments and geometry based on transformations of two- and three-dimensional space. Prerequisite: Graduate standing. (Typically offered: Fall Odd Years)

MATH 5033. Advanced Calculus with Connections to School Mathematics Teaching. 3 Hours.

Rigorous development of the real numbers, continuity, differentiation, and integration. Graduate degree credit will not be awarded for both MATH 4513 (or MATH 5503) and MATH 5033. Prerequisite: Departmental consent. (Typically offered: Irregular)

MATH 504V. Special Topics for Teachers. 1-6 Hour.

Current topics in mathematics of interest to secondary school teachers. Prerequisite: Graduate standing or departmental consent. (Typically offered: Irregular) May be repeated for degree credit.

MATH 5053. Probability & Statistics with Connections to School Mathematics. 3 Hours.

An advanced perspective of probability and statistics as contained in the high school mathematics curriculum with connections to other components of school mathematics. The content is guided by the content of the high school probability and statistics of the Common Core State Standards for Mathematics. Prerequisite: Graduate standing. (Typically offered: Spring)

MATH 507V. Professional Development for Secondary Mathematics Teaching. 1-6 Hour.

Validated participation in professional development mathematics workshops or institutes sanctioned by national or international educational organizations such as the College Board, International Baccalaureate Program, and the National Board for Professional Teaching Standards. Prerequisite: Enrollment in Secondary Mathematics Teaching, MA degree program or departmental consent. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MATH 510V. Mathematical Seminar. 1-3 Hour.

Members of the faculty and advanced students meet for presentation and discussion of topics. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

MATH 5113. Introduction to Abstract Algebra II. 3 Hours.

(Formerly MATH 4113.) Topics in abstract algebra including finite abelian groups, linear groups, factorization in commutative rings and Galois theory. Graduate degree credit will not be given for both MATH 4113 and MATH 5113. Prerequisite: MATH 3113. (Typically offered: Spring)

MATH 5123. Algebra I. 3 Hours.

What the beginning graduate student should know about algebra: groups, rings, fields, modules, algebras, categories, homological algebra, and Galois Theory. Prerequisite: MATH 3113, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5133. Algebra II. 3 Hours.

Continuation of MATH 5123. Prerequisite: MATH 5123, and graduate standing in mathematics or statistics. (Typically offered: Spring)

MATH 5153. Advanced Linear Algebra. 3 Hours.

(Formerly MATH 4103.) Linear functionals, matrix representation of linear transformations, scalar product, and spectral representation of linear transformations. Graduate degree credit will not be given for both MATH 4103 and MATH 5153. Prerequisite: Graduate standing. (Typically offered: Fall)

MATH 5163. Dynamic Models in Biology. 3 Hours.

(Formerly MATH 4163.) Mathematical and computational techniques for developing, executing, and analyzing dynamic models arising in the biological sciences. Both discrete and continuous time models are studied. Applications include population dynamics, cellular dynamics, and the spread of infectious diseases. Graduate degree credit will not be given for both MATH 4163 and MATH 5163. Prerequisite: MATH 2554. (Typically offered: Irregular)

MATH 5213. Advanced Calculus I. 3 Hours.

(Formerly MATH 4513.) The real and complex number systems, basic set theory and topology, sequences and series, continuity, differentiation, and Taylor's theorem. Emphasis is placed on careful mathematical reasoning. Graduate degree credit will not be given for both MATH 4513 and MATH 5213. Prerequisite: Graduate standing. (Typically offered: Fall)

MATH 5223. Advanced Calculus II. 3 Hours.

(Formerly MATH 4523.) The Riemann-Stieltjes integral, uniform convergence of functions, Fourier series, implicit function theorem, Jacobians, and derivatives of higher order. Graduate degree credit will not be given for both MATH 4523 and MATH 5223. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513). (Typically offered: Spring)

MATH 525V. Internship in Professional Practice. 1-3 Hour.

(Formerly MATH 405V.) Professional work experience involving significant use of mathematics or statistics in business, industry or government. Graduate degree credit will not be given for both MATH 405V and MATH 525V. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

MATH 5263. Symbolic Logic I. 3 Hours.

(Formerly MATH 4253.) Rigorous analyses of the concepts of proof, consistency, equivalence, validity, implication, and truth. Full coverage of truth-functional logic and quantification theory (predicate calculus). Discussion of the nature and limits of mechanical procedures (algorithms) for proving theorems in logic and mathematics. Informal accounts of the basic facts about infinite sets. Graduate degree credit will not be given for both MATH 4253 and MATH 5263. Prerequisite: MATH 2603, MATH 2803, or PHIL 2203. (Typically offered: Fall)
This course is cross-listed with PHIL 5253.

MATH 5303. Ordinary Differential Equations. 3 Hours.

Existence, uniqueness, stability, qualitative behavior, and numerical solutions. Prerequisite: MATH 2584 and MATH 4513, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5313. Partial Differential Equations. 3 Hours.

Laplace's equation, Heat equation, Wave Equation, Method of Characteristics. Prerequisite: MATH 4423, MATH 4513, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5323. Partial Differential Equations II. 3 Hours.

Fourier Transforms, Sobolev Spaces, Elliptic Regularity. Prerequisite: MATH 5313 and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

MATH 5353. Mathematical Modeling. 3 Hours.

(Formerly MATH 4153.) Mathematical techniques for formulating, analyzing, and criticizing deterministic models taken from the biological, social, and physical sciences. Techniques include graphical methods, stability, optimization, and phase plane analysis. Graduate degree credit will not be given for both MATH 4153 and MATH 5353. Prerequisite: MATH 2584. (Typically offered: Irregular)

MATH 5363. Scientific Computation and Numerical Methods. 3 Hours.

An introduction to numerical methods used in solving various problems in engineering and the sciences. May not earn credit for this course and MATH 4353 or MATH 4363. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

This course is cross-listed with PHYS 5363.

MATH 5373. Finite Element Methods and Solution of Sparse Linear. 3 Hours.

Provides an in-depth understanding of numerical methods for the solution of partial differential equations using Finite Element Methods, Direct and Iterative Methods for the Sparse Linear Systems. Prerequisite: MATH 5393. (Typically offered: Spring)

MATH 5383. Numerical Analysis. 3 Hours.

(Formerly MATH 4363.) General iterative techniques, error analysis, root finding, interpolation, approximation, numerical integration, and numerical solution of differential equations. Graduate degree credit will not be given for both MATH 4363 and MATH 5383. Prerequisite: Graduate standing. (Typically offered: Fall)

MATH 5393. Numerical Linear Algebra. 3 Hours.

(Formerly MATH 4353.) Numerical methods for problems of linear algebra, including the solution of very large systems, eigenvalues, and eigenvectors. Graduate degree credit will not be given for both MATH 4353 and MATH 5393. Prerequisite: Graduate standing. (Typically offered: Spring)

This course is equivalent to MATH 4353.

MATH 5403. Numerical Linear Algebra II. 3 Hours.

Provides an in-depth understanding of numerical methods for the solution of large scale eigenvalue problems arising in science and engineering applications including theory, implementation and applications. Prerequisite: MATH 5393. (Typically offered: Fall)

MATH 5423. Introduction to Partial Differential Equations. 3 Hours.

Matrices, Fourier analysis, and partial differential equations. Does not count towards degree credit in MATH. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

MATH 5443. Complex Variables. 3 Hours.

(Formerly MATH 4443.) Complex analysis, series, and conformal mapping. Graduate degree credit will not be given for both MATH 4443 and MATH 5443. Prerequisite: MATH 2603 or MATH 2803, and MATH 2584 or MATH 2584C. (Typically offered: Fall)

MATH 5453. Functional Analysis I. 3 Hours.

Banach Spaces, Hilbert Spaces, operator theory, compact operators, dual spaces and adjoints, spectral theory, Hahn-Banach, open mapping and closed graph theorems, uniform boundedness principle, weak topologies. Prerequisite: MATH 5513, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring Odd Years)

MATH 5503. Theory of Functions of a Real Variable I. 3 Hours.

Real number system, Lebesgue measure, Lebesgue integral, convergence theorems, differentiation of monotone functions, absolute continuity and the fundamental theorem of calculus L^p spaces, Holder and Minkowski inequalities, and bounded linear functionals on the L^p spaces. Prerequisite: MATH 4523 or MATH 5223 (formerly MATH 4523), and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

MATH 5513. Theory of Functions of a Real Variable II. 3 Hours.

Measure and integration on abstract measure spaces, signed measures, Hahn decomposition, Radon-Nikodym theorem, Lebesgue decomposition, measures on algebras and their extensions, product measures, and Fubini's theorem. Prerequisite: MATH 5503, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

MATH 5523. Theory of Functions of a Complex Variable I. 3 Hours.

Complex numbers, analytic functions, power series, complex integration, Cauchy's Theorem and integral formula, maximum principle, singularities, Laurent series, and Mobius maps. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513). (Typically offered: Fall)

MATH 5533. Theory of Functions of a Complex Variable II. 3 Hours.

Riemann Mapping Theorem, analytic continuation, harmonic functions, and entire functions. Prerequisite: MATH 5523, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

MATH 5603. Differential Geometry. 3 Hours.

(Formerly MATH 4503.) Topics include: classical differential geometry of curves and surfaces in 3-space, differential forms and vector fields. Graduate degree credit will not be given for both MATH 4503 and MATH 5603. Prerequisite: MATH 2574 or MATH 2574C. (Typically offered: Irregular)

MATH 5703. Topology I. 3 Hours.

An introduction to topology. Topics include metric spaces, topological spaces and general point-set topology, homotopy and the fundamental group, covering spaces, the classification of surfaces. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513), and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall Even Years)

MATH 5713. Topology II. 3 Hours.

The continuation of Topology I. Topics include: advanced homotopy and covering spaces, the Seifert-van Kampen theorem, homology and the Mayer-Vietoris sequence. Prerequisite: MATH 5703, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring Odd Years)

MATH 5723. Differential Topology I. 3 Hours.

An introduction to the topology of smooth manifolds: applications of the inverse function theorem to smooth maps, Sard's theorem, transversality, intersection theory, degrees of maps, vector fields and differential forms on manifolds, integration on manifolds. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513) and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall Odd Years)

MATH 5733. Differential Topology II. 3 Hours.

The continuation of Differential Topology I, with additional advanced topics. Possible advanced topics may include: Morse theory, de Rham cohomology theory, Poincare duality, Riemannian geometry, and Lie groups and Lie algebras. Prerequisite: MATH 5723 and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring Even Years)

MATH 5803. Introduction to Point-Set Topology. 3 Hours.

(Formerly MATH 4703.) A study of topological spaces including continuous transformations, connectedness and compactness. Graduate degree credit will not be given for both MATH 4703 and MATH 5803. Prerequisite: MATH 4513 or MATH 5213 (formerly MATH 4513). (Typically offered: Irregular)

MATH 599V. Research Topics in Mathematics. 1-3 Hour.

(Formerly MATH 499V.) Current research interests in mathematics. Graduate degree credit will not be given for both MATH 499V and MATH 599V. Prerequisite: Departmental consent. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

MATH 609V. Topics in Math Education. 1-6 Hour.

Topics in mathematics education research including curriculum, teacher education, learning theory, and assessment. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 12 hours of degree credit.

MATH 610V. Directed Readings. 1-6 Hour.

Directed readings. Prerequisite: Departmental consent. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

MATH 619V. Topics in Algebra. 1-6 Hour.

Current research interests in algebra. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MATH 6203. Theory of Probability. 3 Hours.

A rigorous mathematical treatment based on measure theory of the fundamental notions and results of the theory of probability. Topics covered include laws of large numbers, central limit theorems, conditional expectations. Additional topics that may be covered include martingales, Markov chains, Brownian motion and stochastic integration. Prerequisite: MATH 5513. (Typically offered: Fall)

MATH 6213. Mathematical Statistics. 3 Hours.

A rigorous mathematical treatment of the fundamental principles and results in the theory of Statistics. Topics include exponential families of distributions, estimation of unknown parameters, the classical theory of theory of hypothesis testing, Large sample approximations, large sample properties of estimators. Prerequisite: MATH 6203. (Typically offered: Spring)

MATH 659V. Topics in Analysis. 1-6 Hour.

Current research interests in analysis. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MATH 679V. Topics in Topology. 1-6 Hour.

Current research interest in topology. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MATH 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Doctoral candidacy in mathematics. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Mechanical Engineering (MEEG) Courses

MEEG 5033. Advanced Mechanics of Materials I. 3 Hours.

Combined stress, theories of failure, thick-walled cylinders, bending of unsymmetrical sections, torsion in noncircular section, plate stresses, and strain energy analysis. Prerequisite: MEEG 2013 and MEEG 3013. (Typically offered: Irregular)

MEEG 5153. Fundamentals of Mechanical Design. 3 Hours.

(Formerly MEEG 4153.) This class is designed to provide engineering students with a head start in industry as design engineers or working in an engineering related function. The course contents cover machine design and analysis experiences as related to working in industry and performing consulting work. Major topics include the design process, design procedures, fasteners, general design and numerous consulting experiences. A concept design exercise and two special design projects will be assigned to the students as homework. Graduate degree credit will not be given for both MEEG 4153 and MEEG 5153. Prerequisite: MEEG 4103. (Typically offered: Fall)

MEEG 5163. Advanced Product Design. 3 Hours.

This course provides an in-depth and comparative study on the theories of engineering design and equips students to understand and utilize the tools and methodologies founded on those theories. (Typically offered: Fall)

MEEG 5173. Model-Based Systems Design and Analysis. 3 Hours.

This course provides students with an introduction into the two main approaches to understanding and designing complex engineered systems. First, the course covers the unique technical challenge of systems engineering and design of systems. Second, the course covers concepts, methods and tools related to 'model-based systems design.' This covers formal modeling of the information content of complex systems. The third portion of the course will focus on modeling the complex behavior of the systems. This is often described as dynamical systems modeling. Students will utilize the methods and tools presented in class to model a complex engineered system of their choice (with instructor approval). The classes will alternate between presenting modeling methods to the students and students demonstrating their system to the class utilizing those methods. Students may not receive credit for both MEEG 4173 and MEEG 5173. Prerequisite: MEEG 4103 or Instructor consent. (Typically offered: Spring Even Years)

MEEG 5203. Robot Modeling and Simulation. 3 Hours.

This is a graduate level course in Robotics dealing with the behavioral study of robots. Topics covered in this course will include but not limited to the following: mathematical modeling of robots, rigid motions and homogeneous transformation, forward/inverse kinematics of robots, velocity kinematics, path and trajectory planning, robot dynamics, joint control, PD/PID control, and multivariable control. Advanced topics may include passivity-based motion control, geometric nonlinear control, computer vision, vision-based control, and sensor fusion. Prerequisite: Graduate standing in MEEG or ELEG and consent of the instructor. (Typically offered: Spring)

MEEG 5253. Bio-Mems. 3 Hours.

Topics include the fundamental principles of microfluidics, Navier-Stokes Equation, bio/abio interfacing technology, bio/abio hybrid integration of microfabrication technology, and various biomedical and biological problems that can be addressed with microfabrication technology and the engineering challenges associated with it. Lecture 3 hours per week. Prerequisite: MEEG 3503 or CVEG 3213 or CHEG 2133. (Typically offered: Spring)
This course is cross-listed with BENG 5253.

MEEG 5263. Introduction to Micro Electro Mechanical Systems. 3 Hours.

A study of mechanics and devices on the micro scale. Course topics will include: introduction to micro scales, fundamentals of microfabrication, surface and bulk micromachining, device packaging, device reliability, examples of micro sensors and actuators. Recitation three hours per week. (Typically offered: Fall)

MEEG 5283. Microelectronics Reliability. 3 Hours.

In this course, students will learn about common failure modes experienced in electronic packaging and devices, with special attention on mechanical and thermally driven failure mechanisms. Additionally, students will gain familiarity with accelerated testing methods and the associated governing standards associated with electronics reliability qualifications used in identifying and certifying electronics for various applications. Prerequisite: ELEG 5273 or instructor consent. (Typically offered: Fall Even Years)

MEEG 5303. Physical Metallurgy. 3 Hours.

Physical and chemical properties of solids and the application of materials in commerce. Prerequisite: MEEG 2303. (Typically offered: Irregular)

MEEG 5333. Introduction to Tribology. 3 Hours.

A study of science and technology of interacting surfaces in relative motion. Topics include solid surface characterization, contact between solid surfaces, adhesion, friction, wear, lubrication, micro/nanotribology, friction and wear screening test methods, and tribological components and applications. Students may not earn credit for both MEEG 5333 and MEEG 4313. Prerequisite: Graduate standing. (Typically offered: Irregular)

MEEG 5343. Computational Material Science. 3 Hours.

This course provides students with an overview of different modeling techniques in material science. Applications will be presented on a broad range of modeling techniques including atomistic simulation methods, Monte Carlo techniques, molecular mechanics, and molecular dynamics. Prerequisite: Graduate standing. (Typically offered: Irregular)

MEEG 5353. Lithium-ion Batteries and Beyond: Materials, Characterization, and Performance. 3 Hours.

This course is intended to provide students an overview of various battery systems and help students establish the concepts of primary and secondary batteries. The course materials will focus on lithium-ion batteries (LIBs), covering their electrochemical mechanisms, components, materials synthesis, materials characterization, and performance evaluations. Prerequisite: CHEM 1103 and MEEG 2303. (Typically offered: Fall)

MEEG 5403. Advanced Thermodynamics. 3 Hours.

An in-depth review of classical thermodynamics, including availability analysis, combustion, and equilibrium, with an introduction to quantum mechanics and statistical thermodynamics. Prerequisite: Graduate standing in Engineering or consent of instructor. (Typically offered: Spring)

MEEG 5453. Advanced Heat Transfer. 3 Hours.

More in-depth study of topics covered in MEEG 4413, Heat Transfer, and coverage of some additional topics. Prerequisite: MEEG 4413 or equivalent. (Typically offered: Fall)

MEEG 5473. Radiation Heat Transfer. 3 Hours.

Spectral analysis, radiant exchange in gray and non-gray enclosures, gas radiation, and multi-mode heat transfer. Prerequisite: MEEG 5453 or equivalent. (Typically offered: Summer Even Years)

MEEG 5483. Thermal Systems Analysis and Design. 3 Hours.

(Formerly MEEG 4483.) Analysis design and optimization of thermal systems and components with examples from such areas as power generation, refrigeration, and propulsion, Availability loss characteristics of energy systems and availability conservation methods. Graduate degree credit will not be given for both MEEG 4483 and MEEG 5483. Prerequisite: MEEG 4413. (Typically offered: Fall and Summer)

MEEG 5503. Advanced Fluid Dynamics I. 3 Hours.

A basic survey of the characteristics of fluid flow under a variety of conditions with examples. Begins with a derivation of the Navier-Stokes equations and an evaluation of the dimensionless groups found from these equations. Topics to be covered include viscous laminar and turbulent boundary layers, jets and wakes, Stokes flow, inviscid flows with and without free surfaces and turbulence. Prerequisite: MEEG 3503 and MATH 2584. (Typically offered: Spring)

MEEG 5513. Introduction to Flight. 3 Hours.

(Formerly MEEG 4503.) The course will provide understanding in basic aerodynamics, airfoil design and characteristics, and flight control surfaces. Graduate degree credit will not be given for both MEEG 4503 and MEEG 5513. Prerequisite: MATH 2584, MEEG 3503. (Typically offered: Fall)

MEEG 5523. Astronautics. 3 Hours.

(Formerly MEEG 4523.) Study of spacecraft design and operations. Graduate degree credit will not be give for both MEEG 4523 and MEEG 5523. Prerequisite: MEEG 2013 and MEEG 2403 or consent of instructor. (Typically offered: Irregular)

MEEG 5533. Fundamentals of Aerodynamics. 3 Hours.

A study of external-flow fluid mechanics applied to Aerodynamics. Topics include integral and differential forms of the basic fluid equations (continuity, momentum, and energy), potential flow, and supersonic flow. Prerequisite: MEEG 3503. (Typically offered: Spring)

MEEG 5633. Additive Manufacturing. 3 Hours.

This course provides an overview of developing opportunities and critical challenges of additive manufacturing (AM, also known as 3-D printing). It covers existing and emerging additive manufacturing processes in the context of product design, materials selection and processing, and industrial and consumer applications. Students may not receive credit for both MEEG 4633 and MEEG 5633. Prerequisite: MEEG 2101, MEEG 2303, MEEG 3013, and MEEG 3503 or instructor consent. (Typically offered: Spring)

MEEG 5733. Advanced Numerical Methods. 3 Hours.

Numerical methods for the solution of linear and non-linear ordinary and partial differential equations; initial and boundary value problems; one-step and multi-step methods; predominantly finite difference but also finite element and control volume techniques; and computer applications. Graduate standing in Engineering or consent of instructor. (Typically offered: Irregular)

MEEG 5833. Aerospace Propulsion. 3 Hours.

(Formerly MEEG 4433.) Principles, operation, and characteristics of gas turbine and rocket engines. Brief study of novel spacecraft propulsion systems. Graduate degree credit will not be given for both MEEG 4433 and MEEG 5833. Prerequisite: MEEG 3503. (Typically offered: Irregular)

MEEG 5853. Industrial Waste and Energy Management. 3 Hours.

(Formerly MEEG 4453.) Applications of thermodynamics, heat transfer, fluid mechanics, and electric machinery to the analysis of waste streams and energy consumption for industrial facilities. Current techniques and technologies for waste minimization and energy conservation including energy-consuming systems and processes, utility rate analysis, economic analysis and auditing are taught. Graduate degree credit will not be given for both MEEG 4453 and MEEG 5853. Prerequisite: MEEG 4413. (Typically offered: Irregular)

MEEG 5873. Indoor Environmental Control. 3 Hours.

(Formerly MEEG 4473.) Gives student a thorough understanding of the fundamental theory of air conditioning design for commercial buildings, including calculating heating and cooling loads along with the proper selection and sizing of air conditioning equipment. Graduate degree credit will not be given for both MEEG 4473 and MEEG 5873. Prerequisite: MEEG 4413. (Typically offered: Irregular)

MEEG 591V. Special Topics in Mechanical Engineering. 1-6 Hour.

Consideration of current advanced mechanical engineering topics not covered in other courses. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MEEG 592V. Individual Study in Mechanical Engineering. 1-6 Hour.

Opportunity for individual study of advanced subjects related to a graduate mechanical engineering program to suit individual requirements. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MEEG 5953. Fundamentals of Fracture and Fatigue in Structures. 3 Hours.

The course will cover the concepts of linear-elastic, elastic-plastic and time-dependent Fracture Mechanics as applied to fracture in a variety of materials, structures, and operating conditions. The examples will include fracture in large components such as aircraft, bridges and pressure vessels and also in bones and in soft materials and human tissue. Prerequisite: Graduate standing in Civil, Mechanical or Biomedical Engineering or consent of the instructor. (Typically offered: Fall and Spring)

This course is cross-listed with BMEG 5953, CVEG 5953.

MEEG 5963. Advanced Fracture Mechanics and Structural Integrity. 3 Hours.

This course provides an in-depth treatment of advanced topics in fracture mechanics such as stress analysis of cracks under elastic-plastic loading, crack initiation and growth under elastic-plastic and time-dependent creep and creep-fatigue conditions. The course emphasizes fundamental underpinnings of nonlinear fracture mechanics and its use in material evaluation and life prediction methodology for structural components. Micro-mechanics of fracture and crack growth processes are also covered. Prerequisite: MEEG 5953, or BMEG 5953, or CVEG 5953 or equivalent, or instructor consent. (Typically offered: Fall and Spring)

MEEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MEEG 6800. Graduate Seminar. 0 Hours.

A periodic seminar devoted to mechanical engineering research topics. Course includes letter grades A, B, C, D, and F as well as CR. (Typically offered: Fall and Spring)

MEEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Music Education (MUED)

Courses

MUED 5513. Seminar: Resources in Music Education. 3 Hours.

Study of the analytical and writing skills necessary for academic research in music education. Each student identifies one problem specific to music education, finds and reviews related literature and sources, develops a comprehensive bibliography, and writes a paper which synthesizes the research. Open to graduate students and undergraduates in honors in music education. (Typically offered: Irregular)

MUED 5653. Seminar: Issues in Music Education. 3 Hours.

A seminar exploring the relationships between the profession of teaching music and selected views about learning theories, teaching methods, philosophy, psychology, and other selected topics relevant to contemporary music education. (Typically offered: Irregular)

MUED 5733. Music Education in the Elementary School. 3 Hours.

Concepts of elementary music education; methods, materials, curriculum design, and supervision in elementary school music. (Typically offered: Irregular)

MUED 5743. Characteristics of Special Needs Students in the Music Classroom. 3 Hours.

A review of characteristics and behaviors of students in the music classroom that have identified or unidentified disabilities in learning. Prerequisite: Admittance into Music Education for Special Needs Students Graduate Certificate. (Typically offered: Fall)

MUED 5753. Teaching Music to Students with Special Needs. 3 Hours.

Instructs students how to construct and implement curriculum and assessments for students with special needs in a music classroom. Prerequisite: MUED 5743. (Typically offered: Spring)

MUED 5763. Practicum in Teaching Music to Students with Special Needs. 3 Hours.

Students will utilize and evaluate designed curriculum and assessment from MUED 5753 in a music classroom. Prerequisite: MUED 5743. Corequisite: MUED 5753. (Typically offered: Spring)

MUED 577V. Special Topics in Music Education. 1-4 Hour.

(Formerly MUED 477V.) Subject matter not covered in other sources. With permission, may be repeated for credit if topics are different. Graduate degree credit will not be given for both MUED 477V and MUED 577V. (Typically offered: Irregular) May be repeated for degree credit.

MUED 5811. Curriculum Design in Music. 1 Hour.

Goals and objectives in music education. Student will develop a curriculum for an actual or hypothetical music education program. (Typically offered: Irregular)

MUED 583V. Workshop: Music in the Elementary School. 1-18 Hour.

An in-service training workshop for elementary music teachers. (Typically offered: Irregular)

MUED 5862. Marching Band Techniques. 2 Hours.

Includes the place of the marching band in the school program, types of formations used, and selecting, arranging or writing the musical score. (Typically offered: Irregular)

MUED 5973. Tests and Measurement in Music. 3 Hours.

This course will address the psychometric concepts of tests and measurement of music achievement, aptitude, attitude, and self-assessment. The course will focus on the teaching and assessment of musical skills, musical responses, and will critically examine existing aptitude tests (Seashore, Watkins Farnum, Gordon, etc.). Basic statistical concepts and data analysis used in common testing scenarios will be introduced. Prerequisite: Graduate standing in music. (Typically offered: Irregular)

MUED 5983. Psychology of Music Behavior. 3 Hours.

This course is an introduction to the psychology of music, and will adopt an interdisciplinary view toward the field, covering such topics as philosophical and sociological questions about the nature and function of music, the physiology of the ear, the physical and perceptual properties of sounds (acoustics), performance anxiety, preference and taste research, social and pedagogical attributes of performance, and behavioral musical responses. Prerequisite: Graduate standing. (Typically offered: Irregular)

MUED 600V. Master's Thesis. 1-6 Hour.

Preparation of a master's thesis as partial fulfillment of the requirement for the master's degree. (Typically offered: Irregular) May be repeated for degree credit.

MUED 605V. Independent Study. 1-6 Hour.

Provides students with an opportunity to pursue special study of problems in music education. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Music Ensemble (MUEN)

Courses

MUEN 5211. Latin American Ensemble. 1 Hour.

This ensemble plays music of Latin America with particular focus on Afro-Caribbean music and its performance practices. Students will have an opportunity to perform, improvise, arrange and compose in a variety of styles such as Son, Danzon, Cha-Cha-Cha, Mambo, Latin Jazz, Salsa, and Timba. The ensemble will perform at least one concert per semester and occasionally will perform at other activities on and off campus. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5221. World Music Ensemble. 1 Hour.

Students in the World Music Ensemble will closely study music and practices from a variety of musical cultures, while simultaneously acquiring solid grounding in music theory, musicianship skills, music history, and literature. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5231. Songwriters' Ensemble. 1 Hour.

A combined songwriting course and contemporary music ensemble. Students build a portfolio of original songs while studying elements of modern songwriting including harmony, lyrics, form, arranging, production and style. The class acts as an ensemble to present a recital of original music for the final performance. (Typically offered: Fall) May be repeated for up to 2 hours of degree credit.

MUEN 5241. Beginning Jazz Combo. 1 Hour.

Introductory ensemble experience offering a repertoire-based approach to learning basic improvisation skills and the performance of common jazz styles. Open to both music and non-music majors. (Typically offered: Spring)

MUEN 5251. Arkansas Soul Band. 1 Hour.

Perform historical and contemporary popular music from the African American tradition. These genres include, but are not limited to, soul, blues, funk, R&B, and hip-hop. Students will develop arranging and musical direction skills, as well as analysis of performance, arrangements, and compositions/songwriting in these styles. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5261. Intermediate Jazz Combo. 1 Hour.

Intermediate small jazz ensemble focused on improvisation in the context of bebop, free jazz, fusion, and related styles. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5271. Advanced Jazz Combo. 1 Hour.

Advanced small jazz ensemble focused on improvisation in the context of bebop, free jazz, fusion, and related styles. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5401. Opera Theatre. 1 Hour.

Study of opera through performances of scenes, chamber and major operatic production. Admission with director's approval. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5411. Men's Chorus. 1 Hour.

Performance-based choral ensemble designed to improve individual and collective vocal skills, develop sight-reading skills, improve the individual's grasp of the essential elements of music, and expose students to repertory of the greater men's chorus canon. Admission is open to any male student on campus. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5421. Inspirational Chorale. 1 Hour.

Performance of African-American literature with particular emphasis on Negro spirituals, traditional/contemporary gospel music and sacred world music. Rehearsal 3 hours per week. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5431. Symphony Orchestra. 1 Hour.

Rehearsal 3 hours per week with extra rehearsals at director's discretion. Admission with director's approval. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5441. Marching Band. 1 Hour.

Rehearsal 8 hours per week. Admission with director's approval. (Typically offered: Fall) May be repeated for degree credit.

MUEN 5451. Schola Cantorum. 1 Hour.

Vocal ensemble limited to the more experienced singers. Rehearsal 5 hours per week. Admission with director's approval. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5461. Wind Symphony. 1 Hour.

Rehearsal 3 to 5 hours per week. Admission by audition and approval of the conductor. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5471. Jazz Orchestra. 1 Hour.

Training in the various styles of jazz and popular music. Rehearsal 3 hours per week. Admission by audition. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5481. Campus Band. 1 Hour.

Rehearsal 3 hours per week. Admission by audition and approval of the conductor. (Typically offered: Spring) May be repeated for degree credit.

MUEN 5491. Concert Band. 1 Hour.

Large ensemble setting with emphasis on performing wind band literature and enhancing the musicianship of members. Focus on performance standards through style and interpretation. Concerts of artistic merit which serve the campus community and general public may be required. Admission is by audition or special approval. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5501. Chamber Music. 1 Hour.

Performance of small ensemble music for any combination of instruments and/or voice. Rehearsal 3 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5521. Woodwind Quintet. 1 Hour.

Study and performance of music for woodwind quintet. Weekly coaching will emphasize intonation, blend, stylistic awareness, and ensemble precision. Repertoire ranges from the 18th to the 20th centuries. 3 hours of rehearsals weekly. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5541. Accompanying. 1 Hour.

Piano accompanying of vocal and instrumental soloists. Rehearsal 2 hours per week. Pre- or Corequisite: MUAP 510V. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5551. Percussion Ensemble. 1 Hour.

Study and performance of ensemble music for multiple percussion instruments. Rehearsal 2 hours per week. (Typically offered: Spring and Summer) May be repeated for degree credit.

MUEN 5561. Musical Theater Orchestra. 1 Hour.

Instrumental ensemble with focus on the preparation and performance of musical theater pit orchestra music, in conjunction with UA Theater's mainstage musical. Admission by audition or director's approval. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 2 hours of degree credit.

MUEN 5591. Women's Chorus. 1 Hour.

Select performance-based choral ensemble designed to improve individual and collective vocal skills, develop sight-reading skills, improve the individual's grasp of the essential elements of music, and expose students to repertory of the greater treble chorus canon. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5691. Wind Ensemble. 1 Hour.

Large ensemble setting performing orchestral wind and symphonic band literature with emphasis on high performance standards through style and interpretation. Concerts of high artistic merit which serve the campus community and general public are required. Admission is by audition. (Typically offered: Fall and Spring) May be repeated for up to 2 hours of degree credit.

MUEN 5721. Clarinet Ensemble. 1 Hour.

Study and performance of music for multiple clarinets, including trios, quartets, quintets, and clarinet choir. Rehearsal 2 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5751. Trumpet Ensemble. 1 Hour.

Study and performance of music for multiple trumpets, including trios, quartets, quintets, and trumpet choir. Rehearsal 2 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5761. New Music Ensemble. 1 Hour.

Small, select ensemble with emphasis on music written in the last hundred years, especially by important living composers. Focus on audience engagement through high performance standards, unconventional settings, and programs unique to the region. Off-campus appearances and outreach activities are required. Admission by consent. (Typically offered: Fall and Spring)

MUEN 5771. Trombone Ensemble. 1 Hour.

Study and performance of music for multiple trombones, including trios, quartets, quintets, and trombone choir. Rehearsal 2 hours per week. (Typically offered: Irregular) May be repeated for degree credit.

MUEN 5781. Tuba Ensemble. 1 Hour.

Study and performance of music for multiple combinations of tuba and euphonium, including trios, quartets, quintets, and low brass choir. Rehearsal 2 hours per week. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUEN 5881. Chamber Choir. 1 Hour.

Continuation of Chamber Choir V for graduate students. Study and performance of vocal chamber music. Rehearsal 2 hours per week for 1 hour of credit. (Typically offered: Fall and Spring)

Music History (MUHS) Courses

MUHS 5253. Special Topics in Music History. 3 Hours.

Topics in world, Western, and popular musics. May be required based on graduate musicology entrance exam. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

MUHS 5563. Collaborative Piano Literature I, Woodwind and Brass Repertoire. 3 Hours.

Survey of collaborative literature for piano and wind or brass instruments. Focus on music for the collaborative duo (instrument and piano) including sonatas and concerti. (Typically offered: Fall Even Years)

MUHS 5573. Collaborative Piano Literature II, String Repertoire. 3 Hours.

Survey of collaborative literature for the piano. Focus on the repertoire of sonatas, concerti and concert works for the piano and instrument (violin, viola, cello, and double bass). (Typically offered: Spring Odd Years)

MUHS 5633. Survey of Symphonic Literature. 3 Hours.

(Formerly MUHS 4733.) A survey of the symphonic literature from its beginning to the present. Graduate degree credit will not be given for both MUHS 4733 and MUHS 5633. (Typically offered: Spring Even Years)

MUHS 5673. Survey of Vocal Literature II. 3 Hours.

(Formerly MUHS 4773.) A survey of concert literature for the solo voice. Graduate degree credit will not be given for both MUHS 4773 and MUHS 5673. Prerequisite: MUHS 4763. (Typically offered: Spring Odd Years)

MUHS 5693. Band Literature. 3 Hours.

(Formerly MUHS 4793.) A study of literature written for performance by concert band, symphonic band, and wind ensemble, representative of the following five periods in Music History: Renaissance (1420-1600), Baroque (1600-1750), Classical (1750-1820), Romantic (1820-1900), and Contemporary (1900-present). Graduate degree credit will not be given for both MUHS 4793 and MUHS 5693. (Typically offered: Irregular)

MUHS 5703. Survey of String Literature. 3 Hours.

(Formerly MUHS 4703.) A survey of solo and chamber music literature involving stringed instruments. Graduate degree credit will not be given for both MUHS 4703 and MUHS 5703. Prerequisite: MUAP 110V and MUTH 3613. (Typically offered: Fall Even Years)

MUHS 5722. Directed Studies in Music Literature I. 2 Hours.

Research in music literature in the performance field of the individual student. (Typically offered: Fall and Spring)

MUHS 5732. Directed Studies in Music Literature II. 2 Hours.

Research in music literature in the performance field of the individual student. Prerequisite: MUHS 5722. (Typically offered: Fall and Spring)

MUHS 5763. Survey of Vocal Literature I. 3 Hours.

(Formerly MUHS 4763.) A survey of concert literature for the solo voice. Graduate degree credit will not be given for both MUHS 4763 and MUHS 5763. (Typically offered: Fall Even Years)

MUHS 5803. Survey of Keyboard Literature I. 3 Hours.

(Formerly MUHS 4803.) A survey of the piano works of outstanding composers. Graduate degree credit will not be given for both MUHS 4803 and MUHS 5803. Prerequisite: MUAP 110V. (Typically offered: Fall Even Years)

MUHS 5813. Survey of Keyboard Literature II. 3 Hours.

(Formerly MUHS 4813.) A survey of the piano works of outstanding composers. Graduate degree credit will not be given for both MUHS 4813 and MUHS 5813. Prerequisite: MUHS 4803. (Typically offered: Spring Odd Years)

MUHS 589V. Seminar in Music History. 1-4 Hour.

(Formerly MUHS 489V.) Subject matter not covered in other courses. With permission, may be repeated for credit if topics are different. Graduate degree will not be given for both MUHS 489V and MUHS 589V. (Typically offered: Irregular) May be repeated for degree credit.

MUHS 5903. Seminar in Musicology. 3 Hours.

Focuses on specialized topics and repertoires within the history of Western music and introduces students to musicological approaches to these subjects. Prerequisite: MUHS 5973 or instructor consent. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUHS 5952. Choral History and Literature I. 2 Hours.

Detailed study of choral history and literature from Gregorian chant to J.S. Bach. (Typically offered: Irregular)

MUHS 5962. Choral History and Literature II. 2 Hours.

Detailed study of choral history and literature from J.S. Bach to the present. (Typically offered: Irregular)

MUHS 5973. Seminar in Bibliography and Methods of Research. 3 Hours.

A survey of the methods and materials of musical research, including bibliography, methods of analysis, and style in the presentation of research results. Open to graduate students and to juniors in Honors. (Typically offered: Fall)

MUHS 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Music Pedagogy (MUPD) Courses

MUPD 5202. Voice Pedagogy I. 2 Hours.

Graduate-level study of the techniques and materials of teaching voice. (Typically offered: Irregular)

MUPD 5763. Piano Pedagogy. 3 Hours.

(Formerly MUPD 4863.) Analytical study and discussion of the various approaches to piano pedagogy and its application in individual/class instruction. Involves demonstration of principles through actual teaching of beginning, intermediate and upper level students. Graduate degree credit will not be given for both MUPD 4863 and MUPD 5763. (Typically offered: Spring Even Years)

MUPD 577V. Special Topics in Pedagogy. 1-6 Hour.

(Formerly MUPD 477V.) Subject matter not covered in other sources. With permission, may be repeated for credit if topics are different. Graduate degree credit will not be given for both MUPD 477V and MUPD 577V. (Typically offered: Irregular) May be repeated for degree credit.

MUPD 582V. Conducting. 1-4 Hour.

Private lessons of 1/2 hour and 1 hour conducting laboratory each week. Development of skills in conducting symphony, choral, opera, oratorio, ballet, and band repertoire. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

MUPD 599V. Special Workshop in Music. 1-6 Hour.

Presented by visiting master artist-teacher in various fields of music performance, teaching and composition. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

Music Theory (MUTH)

Courses

MUTH 5322. Score Reading. 2 Hours.

(Formerly MUTH 4322.) A conductor's approach to the technique of score reading and analysis of orchestra, band, and choral scores for the purpose of preparing composition for rehearsal and performance. Graduate degree credit will not be given for both MUTH 4322 and MUTH 5322. (Typically offered: Fall)

MUTH 5343. Analytical Techniques. 3 Hours.

An intensive study of selected works from music literature. Schenkerian analysis, rhythmic analysis, and set theory analytical techniques will be studied and employed in addition to traditional harmonic and formal analysis. Prerequisite: MUTH 3613 or equivalent and graduate standing. (Typically offered: Irregular)

MUTH 5612. Orchestration. 2 Hours.

(Formerly MUTH 4612.) A continuation of study of the capabilities of the various orchestral and band instruments and their use in arrangement for ensembles, band, and orchestra. Scoring for orchestra. Graduate degree credit will not be given for both MUTH 4612 and MUTH 5612. Prerequisite: MUTH 3613. (Typically offered: Spring)

MUTH 5623. Pedagogy of Theory. 3 Hours.

Detailed study of methods of teaching undergraduates courses in music theory and aural perception. Prerequisite: Graduate standing. (Typically offered: Irregular)

MUTH 5643. Analysis of 20th Century Music. 3 Hours.

Study of 20th century music and analytic techniques including pitch class set theory and serial techniques. Prerequisite: Graduate standing. (Typically offered: Irregular)

MUTH 5672. Advanced Orchestration. 2 Hours.

A study of advanced principles of orchestral writing through individual projects in scoring and analysis. Prerequisite: MUTH 4612 or MUTH 5612 (formerly MUTH 4612) or equivalent. (Typically offered: Irregular)

MUTH 568V. Composition. 1-4 Hour.

Private lessons of one-half hour, and one hour of composition laboratory session each week. Development of skills in creative musical expression specifically for composition-theory majors - others admitted by consent. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

MUTH 5703. Writing Music Analysis. 3 Hours.

(Formerly MUTH 4703.) Analysis of music with an emphasis on analytical writing skills and the use of library source materials. Graduate degree credit will not be given for both MUTH 4703 and MUTH 5703. Prerequisite: MUTH 3603. (Typically offered: Spring)

MUTH 577V. Special Topics in Music Theory. 1-4 Hour.

(Formerly MUTH 477V.) Subject matter not covered in other courses. Graduate degree credit will not be given for both MUTH 477V and MUTH 577V. Prerequisite: Instructor consent. (Typically offered: Irregular) May be repeated for up to 4 hours of degree credit.

MUTH 599V. Independent Study in Music Theory. 1-6 Hour.

Provides students with an opportunity to pursue special study of topics in music theory. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

MUTH 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Nursing (NURS)

Courses

NURS 5003. Theoretical and Scientific Foundations for Nursing Practice. 3 Hours.

The course utilizes the critical reasoning process to examine the element of nursing knowledge. Emphasis is placed on concept analysis and the evaluation of nursing theories. Identification of the links between theory and empirical indicators is examined. The clinical relevance of mid-range and practice theories is explored. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 5033. Scientific Foundations and Role Development in Advanced Practice Nursing. 3 Hours.

Examines development of the advanced practice nursing role and evolution of the Doctor of Nursing Practice (DNP). Concepts include scientific foundations of practice, role development, interdisciplinary collaborative strategies, advanced scope of practice, patient advocacy, and legal/ethical principles in the advanced practice role. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 5043. Concepts of Health Promotion Within Diverse Populations. 3 Hours.

Provides a theoretical base for health promotion, risk reduction and disease prevention at the individual, family and community levels. A cross-disciplinary approach to achieve or preserve health is identified. Focuses on holistic plans and interventions that address the behavioral and social factors that contribute to morbidity and mortality in diverse populations. Provides opportunity to develop, implement, and evaluate health promotion interventions for selected clients. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Spring)

NURS 5053. Evidence-Based Practice and Innovation in Nursing. 3 Hours.

Examines models and strategies for leadership in evidence-based practice and innovation, outcomes management, and translational scholarship. The emphasis of this course is on problem identification, information retrieval, critical appraisal, and synthesis of a body of evidence. It provides the student with the foundation for MSN and DNP evidence-based projects. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Spring)

NURS 5063. Health Care Policy. 3 Hours.

Provides knowledge and understanding needed to participate in policy development analysis and implementation. Provides an overview of the political process, health care policy, advocacy, leadership roles, legislative and regulatory issues, health care financing, and evaluating outcomes. Access, cost, and quality of health care are major foci in this course. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Summer)

NURS 5073. Curriculum Design and Development in Nursing Education. 3 Hours.

This course provides the essential elements that define and operationalize the process of curriculum design and development. Students will examine curriculum theories, models, and concepts from the perspective of nursing education. They will analyze factors that influence program and curriculum development. Historical and philosophical foundations of nursing practice and educational principles are examined. The application and synthesis of curriculum theory and their application to nursing is emphasized. The role of the educator in the dynamic relationship between the practice setting, research, and curriculum is examined. Students will participate in the design of curriculum which reflects professional nursing practice, standards, theory, and research. Prerequisite: Admission to the Graduate Program or departmental consent. Completion of all general and research core classes or approval of the MSN Education Program Coordinator. (Typically offered: Fall and Spring)

NURS 5083. Methods of Assessment and Evaluation in Nursing Education. 3 Hours.

This course is one of four offered in the nursing education concentration in preparation for the role of educator in academic and clinical settings. Students explore theories, models, and evidence for best practice in assessing learning - including constructing exam items and creating tools for assessing writing assignments. Students discuss grading and other concepts related to assessment and evaluation as it relates to nursing education. Pre- or Corequisite: Completion of NURS 5073 or NURS 5093. Prerequisite: Admission to the Masters of Science in Nursing or the Doctor of Nursing Practice Program. (Typically offered: Summer)

NURS 5093. Instructional Design and Delivery in Nursing Education. 3 Hours.

This course is one of four offered in the nursing education concentration in preparation for the role of educator in academic and clinical settings. Students explore teaching and learning theories and other evidence to guide practice in the advanced role of the educator. Students gain competencies in the knowledge and skills necessary for delivering evidence-based teaching and learning strategies in a variety of learning environments. Prerequisite: Admission to the Graduate Program or departmental consent. (Typically offered: Spring)

NURS 5101. Advanced Health Assessment and Diagnostic Reasoning. 1 Hour.

Applies health assessment, physical examination techniques, clinical decision making, and diagnostic reasoning to formulate a culturally-sensitive, individualized plan of care, which includes health promotion and disease prevention. Corequisite: NURS 5112. (Typically offered: Fall)

NURS 5112. Advanced Health Assessment and Diagnostic Reasoning Clinical Practicum. 2 Hours.

Focus is on the application of clinical decision making, diagnostic reasoning, and advanced physical examination techniques to develop differential diagnoses, problem list, and a plan of care for individual clients. Corequisite: NURS 5101. (Typically offered: Fall)

NURS 5123. Pharmacotherapeutics. 3 Hours.

Provides advanced concepts and application of pharmacology for broad categories of agents used in disease management. Establishes the relationship between pharmacologic agents and physiologic/pathologic responses. It assists students with the development of knowledge and skills to prescribe and manage a client's health in a safe, high quality, and cost-effective manner. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Spring)

NURS 5143. Advanced Pathophysiology. 3 Hours.

Provides a comprehensive understanding of normal physiologic and pathologic mechanisms of disease that serves as a foundation for clinical assessment, decision making, and management of individuals. Includes mechanisms of disease, genetic susceptibility, and immune responses in selected disorders. This course includes concepts of pathophysiology across the lifespan. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 5272. Clinical Practicum: Interpretive Diagnostic Reasoning. 2 Hours.

Application of principles of pathologic mechanisms of disease, pharmacotherapeutics, and pharmacokinetics to refine and synthesize skills for history taking, physical examination, clinical assessment, diagnostic reasoning, and decision making for adult and geriatric individuals. Pre- or Corequisite: NURS 5101, NURS 5112, NURS 5143 and NURS 5123. (Typically offered: Summer)

NURS 5303. Foundations of Nursing Education. 3 Hours.

Considers the principles, philosophies, theories, and strategies of teaching, learning, and evaluation needed in nursing education. (Typically offered: Fall)

NURS 5313. Curriculum and Evaluation in Nursing Education. 3 Hours.

Considers knowledge and skills needed for curriculum and program development and evaluation for a variety of nursing education settings. (Typically offered: Summer)

NURS 5323. Teaching in Nursing Practicum. 3 Hours.

Supervised experience in the nurse educator role in both classroom and clinical settings. (Typically offered: Fall)

NURS 5332. Common Problems in Acute Care in Adult and Gerontology Populations Clinical Practicum. 2 Hours.

Focuses on the management of adult-gerontology patients with common acute illnesses. Emphasizes the application of principles of pathologic mechanisms of disease, history taking, physical examination, and clinical decision making. Corequisite: NURS 5434. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5343. Specialty Development I. 3 Hours.

This course will include two foci. There will be readings focused on current topics in a specialty area. A focused field experience will allow student to integrate knowledge and skills in a specialty area of nursing in preparation for the nurse educator role. (Typically offered: Spring)

NURS 5353. Specialty Development II. 3 Hours.

Building on the Independent Study: Specialty Development I, this course will include two foci. There will be readings focused on current topics in a specialty area. A focused field experience will allow student to integrate knowledge and skills in a specialty area of nursing in preparation for the nurse educator role. Prerequisite: NURS 5343. (Typically offered: Fall)

NURS 5403. Scholarly Writing. 3 Hours.

This course will focus on the fundamentals of academic writing at the graduate level with the goal of honing students' critical reading and writing skills. Attention will be given to mechanics, usage, and style, as well as to handling and citing sources. The emphasis throughout is on creative thinking and precise, scholarly writing. Prerequisite: Completion of a baccalaureate degree and acceptance into the graduate program. (Typically offered: Fall and Summer)

NURS 5413. Executive Leadership in Nursing. 3 Hours.

This course focuses on the health care structures and processes, human capital management, health and public policy, communication principles and styles, negotiations, leadership effectiveness, strategic visioning, ethics and advocacy, and innovation. Learning will enable the professional nurse executive to lead complex health care environments applying an advanced skill set in each of the focus areas. Prerequisite: NURS 5403, NURS 5523, NURS 5043, NURS 5053, NURS 5063, MBAD 5241, HRWD 5233, NURS 6233, ESRM 6403. (Typically offered: Spring)

NURS 5423. Health Systems Operations. 3 Hours.

This course focuses on the complex practice environment. Enables the professional nurse leader to demonstrate knowledge of care management and delivery, professional practice environment and models, and quality monitoring and improvement. Professional practice and health care delivery models and settings, role delineation, laws and regulations, accreditation, and professional practice standards will be emphasized. Prerequisite: NURS 5403, NURS 5523, NURS 5043, NURS 5053, NURS 5063, MBAD 5241, HRWD 5233, NURS 6233, ESRM 6403. (Typically offered: Fall)

NURS 5434. Common Problems in Acute Care in Adult and Gerontology Populations. 4 Hours.

Examine principles of pathologic mechanisms of disease, refine skills for history taking, physical examination, and clinical decision making for adult and geriatric individuals with common acute illnesses. Corequisite: NURS 5443. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5443. Chronic Health Problems in Adult and Gerontology Populations. 3 Hours.

Explores evidence-based models for the management of selected chronic conditions, focusing on assessment and treatment of individuals and families. Utilizes advanced theories, concepts, knowledge, and skill in the care of diverse adult and geriatric populations with complex chronic health problems. Corequisite: NURS 5454. Prerequisite: Completion of NURS 5434 and NURS 5332. (Typically offered: Fall)

NURS 5454. Chronic Health Problems in Adult and Gerontology Populations Clinical Practicum. 4 Hours.

Focuses on the management of adult-gerontology populations with complex, chronic health problems. Emphasis is on the application of theoretical concepts, assessment skills, clinical decision making, and evidence-based standards to formulate diagnoses, clinical impressions, treatment, and evaluation plans in the acute or out-patient setting. Corequisite: NURS 5443. Prerequisite: NURS 5434 and NURS 5332. (Typically offered: Fall)

NURS 5463. Acute and Critical Illness in Adult and Gerontology Populations. 3 Hours.

Provides an in-depth knowledge of management of acutely and critically ill adults. Emphasis is on the use of evidence-based knowledge to formulate diagnoses, treatment, evaluation plans, and referral for adults who have complex acute or critical health problems, or are at high risk for developing complications. Corequisite: NURS 5475. Prerequisite: NURS 5443 and NURS 5454. (Typically offered: Spring)

NURS 5475. Acute and Critical Illness in Adult and Gerontology Populations Clinical Practicum. 5 Hours.

Experiences allow the student to apply safe, scientifically sound, cost effective, legal and ethical management strategies to the care of adults with complex acute and critical illness. Emphasis is on the development of advanced clinical skills in acute and critical care settings. Corequisite: NURS 5463. Prerequisite: NURS 5443 and NURS 5454. (Typically offered: Spring)

NURS 5483. Common Problems in Primary Care. 3 Hours.

Examines principles of pathological mechanisms of disease, refines knowledge for thorough history taking, physical examination, and clinical decision-making for men, women, and families with common illnesses treated in primary care. Includes anticipatory guidance, health promotion, disease prevention, and reproductive health. Corequisite: NURS 5495. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5495. Common Problems in Primary Care Clinical Practicum. 5 Hours.

Clinical component to 5483 Common Problems Primary Care. Refines skills for thorough history taking, physical examination, and clinical decision-making for men, women, and families with common illnesses treated in primary care as well as health promotion, disease prevention, and reproductive health needs. Corequisite: NURS 5483. Prerequisite: NURS 5101 and NURS 5112. (Typically offered: Spring)

NURS 5523. Healthcare Informatics. 3 Hours.

Prepares graduate students to serve as leaders in the utilization of information systems and technology to support and improve education, patient care, and healthcare systems. Assists students in evaluating and integrating qualified technologies into various practice settings. Students will explore current and emerging trends in Healthcare Informatics and their legal, ethical, and political implications. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Summer)

NURS 5543. Primary Care of Children. 3 Hours.

Focuses on evidence-based models for the management of children from diverse cultures with common conditions in primary care. Includes anticipatory guidance, health promotion, and disease prevention. Emphasis on application of theoretical concepts, assessment skills, clinical decision-making, and evidence-based standards to formulate differential diagnoses, clinical impressions, treatment, and evaluation plans in primary care. Corequisite: NURS 5683. Prerequisite: NURS 5873 and NURS 5884. (Typically offered: Spring)

NURS 5683. Primary Care of Children Clinical Practicum. 3 Hours.

Focuses on the management of children in the clinical setting with emphasis on holistic assessment and treatment of this population and their families. Students will engage in the assessment, diagnosis and treatment of conditions common to primary practice in pediatric clinics. This course will consist of 135 contact hours. Corequisite: NURS 5543. Prerequisite: NURS 5873 and NURS 5884. (Typically offered: Spring)

NURS 579V. Independent Study. 1-3 Hour.

Independent study designed by student with faculty advisor. May be completed as alternative to thesis. (Typically offered: Fall, Spring and Summer)

NURS 5873. Complex Problems in Primary Care. 3 Hours.

Focuses on application of health promotion and chronic disease management in complex adult patients. Students will utilize evidence-based approaches to health promotion, assessment, differential diagnosis and disease management. Emphasizes clinical decision making, chronic care models, coordination of care, poly-drug therapy and information systems. Corequisite: NURS 5884. Prerequisite: NURS 5483 and NURS 5495. (Typically offered: Fall)

NURS 5884. Complex Problems in Primary Care Clinical Practicum. 4 Hours.

Clinical component to NURS 5873 Complex Problems in Primary Care. Offers the student an opportunity to exercise critical judgment and implement theoretical knowledge in the management of care of adults experiencing complex health problems. Corequisite: NURS 5873. Prerequisite: NURS 5495 and NURS 5483. (Typically offered: Fall)

NURS 598V. Nursing Special Topics. 1-6 Hour.

Special Topics course to fulfill national accrediting body for Family Nurse Practitioner. Prerequisite: NURSDP major. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

NURS 599V. Seminar. 1-3 Hour.

Selected topics in nursing explored in discussion format. (Typically offered: Irregular)

NURS 600V. Master's Thesis. 1-3 Hour.

Student research to fulfill degree requirement for the MSN. Prerequisite: NURS 5053. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

NURS 6123. Evaluation Methods and Translational Research for Evidence-based Practice. 3 Hours.

The translation of evidence into practice, including theoretical and practical challenges, is analyzed through the use of case studies and proposals. Uses methods of inquiry for systematic appraisal of nursing practice or healthcare programs to identify practice outcomes and create an environment to support and sustain changes. Prerequisite: NURS 6343 or by permission of the instructor. (Typically offered: Spring)

NURS 6224. DNP Clinical Practicum I. 4 Hours.

Provides an opportunity to synthesize advanced knowledge and role behaviors within a specialty concentration. Designed to apply nursing theory, translational research, epidemiologic principles, ethical/legal principles, outcome evaluations, healthcare systems thinking, and economics into a specialized clinical practice role and setting. Depending upon specialty and experience, may require travel to campus. Prerequisite: NURS 5443, NURS 5454, NURS 5463, and NURS 5475. (Typically offered: Summer)

NURS 6233. Healthcare Economics and Finance. 3 Hours.

Provides economic, financial, and business knowledge and skills required for a leadership role in financial planning and decision making within healthcare delivery systems. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Fall)

NURS 6244. DNP Clinical Practicum II. 4 Hours.

Provides an opportunity to synthesize advanced knowledge and role behaviors within a specialty concentration. Designed to apply nursing theory, translational research, epidemiologic principles, ethical/legal principles, outcome evaluations, healthcare systems thinking, and economics into a specialized clinical practice role and setting. Depending upon specialty and experience, may require travel to campus. Corequisite: NURS 7122. Prerequisite: NURS 6224. (Typically offered: Fall)

NURS 6263. Organization Management and Systems Leadership. 3 Hours.

Facilitates understanding of how to lead, advocate, and manage innovative responses to organizational needs and challenges. Emphasizes development and evaluation of care delivery models that meet the needs of targeted patient populations by enhancing accountability for effective and efficient healthcare, quality improvement, and patient safety. Prerequisite: Admission to the graduate program or by permission of the instructor. (Typically offered: Summer)

NURS 628V. DNP Clinical Practicum III. 1-8 Hour.

Allows for the continuation of specialty role development and a more refined and advanced approach to care delivery, systems thinking, and leadership. Allows for the total number of practice hours required for certification and/or degree. Corequisite: NURS 5543, NURS 5683, NURS 5463, and NURS 5475. (Typically offered: Spring) May be repeated for up to 8 hours of degree credit.

NURS 6343. Analytic Methods and Epidemiology for Health Care. 3 Hours.

This course will examine the role of epidemiology and statistics in advanced nursing practice. The student will learn how the concepts of epidemiology are used to measure and describe the health of individuals and populations and apply statistical concepts and analytical methods to data encountered in practice. Major topics to be covered include sources of data, study designs, analytical strategies and interpretation of data related to disease causality, risk, and prevalence. Prerequisite: ESRM 5393. (Typically offered: Fall, Spring and Summer)

NURS 6862. Rural Primary Care in Arkansas. 2 Hours.

This is a rural health course elective for graduate nursing students. The purpose of this course is to prepare them for the role of nurse practitioner educator in the academic setting by providing additional knowledge and exposure to topics and diseases seen in rural primary care in Arkansas. (Typically offered: Fall and Spring)

NURS 6882. Opioid Use in Rural Arkansas. 2 Hours.

This course prepares graduate nursing students for the nurse practitioner role in rural settings by providing knowledge, exposure to risk factors, treatment strategies for opioid abuse and misuse, policies and regulations related to prescribing opioids, and gaps in community responses addressing this epidemic in rural primary care in Arkansas. (Typically offered: Fall and Spring)

NURS 7113. Capstone Seminar I. 3 Hours.

Designed to unify and organize the student's field of inquiry for the final Capstone Project. Emphasis is on the application of an evidence-based intervention suitable to their area of focus that involves appropriate methodology and application with the goal for change in practice or outcome analysis. Prerequisite: Completion of NURS 6224 and/or permission of the instructor. (Typically offered: Fall)

NURS 7122. DNP Project Implementation I. 2 Hours.

Provides necessary support and elements for students to begin execution of the DNP Project in collaboration with the sponsoring site. (Typically offered: Fall)

NURS 7132. Capstone Seminar II. 2 Hours.

Focuses on data exploration and analysis for the organization and refinement of all aspects of Capstone Project, emphasizing implementation and evaluation of the evidence-based intervention. Allows student to finalize the scholarly written and oral report for dissemination of results. Corequisite: NURS 7142. Prerequisite: NURS 7113 and NURS 7122. (Typically offered: Spring)

NURS 7142. DNP Project Implementation II. 2 Hours.

Provides an avenue for students to complete and disseminate the DNP project. Allows students the opportunity to synthesize and demonstrate the ability to employ effective communication and collaboration skills, leadership roles, influence healthcare quality and safety, evaluate practice, and successfully negotiate change in healthcare delivery for individuals, families, populations, or systems. Prerequisite: NURS 7122. (Typically offered: Spring)

Operations Management (OMGT) Courses

OMGT 5003. Introduction to Operations Management. 3 Hours.

Provides an overview of the functional activities necessary for the creation/delivery of goods and services. Topics covered include: productivity; strategy in a global business environment; project management; quality management; location and layout strategies; human resources management; supply chain and inventory management; material requirements planning; JIT; maintenance and reliability; and other subjects relevant to the field. Required course. Pre- or Corequisite: OMGT 4853. Prerequisite: OMGT 4333, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. MSE or MSEM students may take the course with advisor consent. (Typically offered: Fall and Spring)

OMGT 5013. Supply Chain Management for Operations Managers. 3 Hours.

Focuses on the development and application of decision models in supply chains with emphasis on supply chain performance, cost, and metrics; demand forecasting; aggregate planning; inventory management; supply chain design and distribution; transportation modeling and analysis; supply chain coordination; the role of information technology; and sourcing decisions. Spreadsheet tools and techniques will be used to analyze supply chain performance. Prerequisite: OMGT 4333, OMGT 4853 and admitted to OPMGMS, EMGTMS, ENGRME or OMPMGC Graduate Certificate Program, or departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5113. Human Resource Management. 3 Hours.

A review of Human Resources Management functions as they apply in today's business setting with specific emphasis on regulatory compliance, total rewards systems, recruitment, training, and employment practices. The course is designed both for HRM professionals and for line managers/professionals who need to understand the roles and responsibilities of HR as a business partner. Prerequisite: OMGT 4313, OMGT 5003 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5123. Finance for Operations Managers. 3 Hours.

Examines the scope and environment of finance for operations managers. Topics include financial markets, interest rates, financial statements, cash flows, and performance evaluation. Valuation of financial assets, using time value of money; the meaning and measurement of risk/return; capital-budgeting, cost of capital, capital structure, dividend policy, and working capital management are also covered. Required course (may substitute OMGT 5463). Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4323, OMGT 4853 and admitted to OPMGMS, EMGTMS, ENGRME, or OMPMGC Graduate Certificate Program, or departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5133. Operations Management in the Service Sector. 3 Hours.

Review of the role of the operations management in the service sector, e.g., health care systems, banking, municipal services, utilities, and postal service and others. Emphasizes the principles and methodologies applicable to the solution of problems within the service industries. Pre- or Corequisite: OMGT 5003. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5143. Strategic Issues in Human Resource Management. 3 Hours.

Explores the concept of Strategic Human Resource Management with emphasis on effective partnering by various HR functions with all levels of management to support the large-scale, long-range goals of achieving success in the organization's chosen markets. Internal and external impacts on and of HR in all areas will be examined. Students will analyze case studies to build on basic concepts acquired in OMGT 5113. Prerequisite: OMGT 5003, OMGT 4313, OMGT 5113 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5253. Leadership Principles and Practices. 3 Hours.

The course is designed to expose students to multiple approaches to leadership in a wide variety of settings. Leadership styles, the knowledge areas and competencies expected of today's leaders, the challenges leaders face, the historical and philosophical foundations of leadership, the relationships among leadership theory, leadership practice, and the moral-ethical aspects of leadership are among the topics covered in the course. A number of respected regional, national, and international leaders share 'lessons learned' in their leadership journeys. Plus, a number of highly regarded leadership books and case studies on leadership are read and discussed. Students may not receive credit for INEG 4253 and INEG 5253/OMGT 5253. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer)

This course is cross-listed with INEG 5253.

OMGT 5303. Health Care Policies and Issues. 3 Hours.

Explores health care management strategies and policy development with emphasis on health insurance, Medicare, Medicaid and managed care, as well as employee health benefits. The roles of government and business in policy formulation are addressed, as are the problems of financing health care, legal and ethical considerations, current healthcare issues, and quality measures. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5373. Quality Management. 3 Hours.

Introduces students to quality management concepts and their use in enhancing organizational performance and profitability. History of the quality movement, its broad application in key economic sectors, and philosophical perspectives of major quality leaders will be discussed. Focus is on continuous process improvement, using data and information to guide organizational decision-making. The Six Sigma approach and associated statistical tools, supporting process improvement, are also covered. Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4333 and OMGT 4853, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5403. Industrial Safety and Health Administration. 3 Hours.

Based on Federal Regulations for Occupational Safety and Health, the course examines current regulations, as well as their commonsense application. Covers various standards, such as those for material handling, personal protective equipment, toxic substances, and machine guarding. Uses case studies and real world scenarios to present topics and demonstrate their application. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5423. Operations Management & Global Competition. 3 Hours.

Studies of principles and cases in business/industrial administration in global competition. Survey of markets, technologies, multi-national corporations, cultures, and customs. Discussion of ethics, professionalism, difference valuing, human relations skills, and other topics relevant to global practice. Pre-or Corequisite: OMGT 5003. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Spring)

OMGT 5433. Cost Estimation Models. 3 Hours.

Overview of cost estimation techniques and methodologies applied to manufacturing and service organizations. Accomplished through detailed analysis of the cost estimation development process and various cost estimation models. Topics include data collection and management, learning curves, activity based costing, detailed and parametric estimation models, and handling risk and uncertainty. Prerequisite: OMGT 4853 and OMGT 4333, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

This course is cross-listed with INEG 5433.

OMGT 5443. Decision Models. 3 Hours.

Focus on quantitative decision models for technical and managerial problems for private and public organizations. Topics include shareholder value, stakeholder value, Value-Focused Thinking, axioms of decision analysis, decision making challenges, decision traps, cognitive biases, decision processes, decision framing, influence diagrams, value hierarchy structuring, designing creative alternatives, single objective models, multiobjective additive value model, swing weights, sensitivity analysis, portfolio decision models with binary linear programming, probability elicitation, Bayes Theorem, decision trees, Monte Carlo simulation, expected value, dominance (deterministic and stochastic), tornado diagrams, value of information, risk preference, utility models, expected utility, and communicating analysis insights. Prerequisite: (OMGT 5003, OMGT 4333, and OMGT 4853) or INEG 2313, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

This course is cross-listed with INEG 5443.

OMGT 5463. Economic Decision Making. 3 Hours.

Principles of economic analysis with emphasis upon discounted cash flow criteria for decision-making. Comparison of criteria such as rate of return, annual cost, and present worth for the evaluation of investment alternatives. Required course (may be substituted by OMGT 5123). Prerequisite: OMGT 5003, OMGT 4323 and OMGT 4853, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5473. Lean Six Sigma. 3 Hours.

This course covers the application of lean principles to manufacturing, service and government processes in order to improve productivity, increase value and eliminate waste as well as the use of the Six Sigma problem solving methodology to reduce variation and improve quality. Students will gain experience with the tools and analysis methods used in both approaches. The topics covered include: methods for creating Lean processes, proven lean problem-solving methodologies, managing a lean transformation, implementing a Six Sigma initiative, and executing the five phases of the Six Sigma DMAIC process, and communicating results to stakeholders and decision-makers. Prerequisite: (OMGT 5003 or departmental consent), and admitted to the (Master of Science in Operations Management Program, or the Project Management Graduate Certificate Program, or be a non-degree seeking graduate student with departmental consent). (Typically offered: Fall, Spring and Summer)

OMGT 5493. Advanced Lean Six Sigma. 3 Hours.

With an emphasis on application, this course builds upon the Lean Six Sigma and Quality Management courses and covers analysis techniques for Lean Six Sigma problem solving in the Analyze, Improve, and Control phases of the DMAIC process. The topics covered include descriptive versus inferential statistics, sampling, Hypothesis Testing with Normal and Non-Normal Data, regression analysis, design of experiments, and control charts. Prerequisite: OMGT 5473 and OMGT 5373. (Typically offered: Fall, Spring and Summer)

OMGT 5503. Maintenance Management. 3 Hours.

Principles and practices of maintenance department organization, prevention procedures, and typical equipment problems. Includes related topics such as plant protection, preventative and plant maintenance. Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4333 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5613. Lean Production and Inventory Control. 3 Hours.

Defines analytical methods used to support inventory replenishment for the production of goods and services. Operational problems of production systems are examined, including objective/subjective forecasting methods, aggregate planning of work force and production under seasonal demand; and inventory models of EOQ for known and unknown demand. Supply chain management and lean manufacturing concepts are also discussed. Prerequisite: OMGT 4333 and OMGT 5003, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5623. Strategic Management. 3 Hours.

Examines strategic management, which is defined as the art and science of formulating, implementing, and evaluating cross-functional decisions that enable an organization to achieve its long-term objectives. Principles of strategic management will be covered in conjunction with case studies to provide opportunity for analysis and experience in applying these principles in an operations management environment. Required course. Prerequisite: OMGT 5003 and OMGT 4313, and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5633. Linkages among Technology, Economics and Societal Values. 3 Hours.

Addresses how macro-level change is influenced by the linkages among technology, economics and societal values. Three major course initiatives: 1) Developing a conceptual model for understanding how macro-level change has occurred over history; 2) Examining recorded history in order to develop a contextual appreciation for Society's current situation; and 3) Using statistical data to identify six overriding world trends that are likely to greatly impact society's goal of achieving sustainable prosperity and well being in the foreseeable future. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)
This course is cross-listed with BENG 5633.

OMGT 5653. Introduction to Data Analytics for Operations Managers. 3 Hours.

Introduces data science and data analytics. Provides basic skill instruction in the statistical data analysis programming language R. Provides experience building and interpreting descriptive and predictive data analytics models. Provides operations managers with the skill and tools to use and understand advanced data analytics methods. Provides practice communicating those results to senior stakeholders and decision makers. Prerequisite: OMGT 5003 or EMGT 5033, must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5673. Principles of Operations Research. 3 Hours.

Surveys the mathematical models used to design and analyze operational systems. Includes linear programming models, waiting line models, computer simulation models, and management science. Students will be introduced to applications of operations research and solution methods, using spreadsheet software. Pre- or Corequisite: OMGT 5003 and OMGT 4853. Prerequisite: OMGT 4333 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5733. Human Behavior Analysis. 3 Hours.

Examination of the principal drivers of individual and group behavior in organizations with coverage of practical applications of concepts in organizational behavior for operations managers. In addition to group behavior and organizational processes, the course explores people management challenges that result from external pressures on stakeholders (e.g. competitive, economic, social, political, and regulatory impacts). Pre- or Corequisite: OMGT 5003. Prerequisite: OMGT 4313 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 577V. Special Problems. 1-3 Hour.

Application of previous course work knowledge to problems encountered in military base and civilian operations. Problems are proposed by students according to individual interests and needs. Used for courses in specific concentration, certificate or focus areas with parenthetical titles. Maybe used for courses in development. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

OMGT 5783. Project Management for Operations Managers. 3 Hours.

An introduction to the Critical Path Method and Program Evaluation and Review Technique. Covers project planning and control methods; activity sequencing; time-cost trade-offs; allocation of manpower and equipment resources; scheduling activities and computer systems for PERT/CPM with emphasis on MS project. Case studies include topical issues combining methodologies and project management soft skills, such as conflict management, negotiation, presentations to stakeholders, and team building. Required course. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5793. Risk Management. 3 Hours.

Students will learn to apply tools to identify, assess, communicate and manage risk. Course work includes methods to identify risks, develop risk models, assess risk, and evaluate risk management options. Case studies are used to understand risk management challenges in systems development in complex organizations. Prerequisite: OMT 5003 or OMT 5033, must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5823. Information Technology for Operations Managers. 3 Hours.

Information Technology for the management and control of information systems and processes used in operations management. Topics covered include e-Business and e-Commerce Systems, Management Information Systems (MIS), Data Resource Management, Networking, Decision Support, Information Security, Enterprise and Global IT, and IT Strategies and Solutions for Operations Managers. Pre- or Corequisite: OMT 5003. Prerequisite: OMT 4853 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5833. Decision Support Application Development for Operations Management. 3 Hours.

Students will utilize Microsoft Excel and will write programming code in Visual Basic for Applications to develop custom solutions to challenging operations management problems. Emphasis will be placed on computing productivity in a spreadsheet-based setting to develop practical, useful decision support applications and computer programs to support operations management. Assumes basic knowledge of programming. Pre- or Corequisite: OMT 5003. Prerequisite: OMT 4853 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5873. Organizing for Change. 3 Hours.

Provides an overview of fundamental management functions, organizational decision-making authority, structures and controls to support managing change. Topics include leadership, strategy and ethical perspectives on change management. Pre- or Corequisite: OMT 5003. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5903. Operations Management of Unmanned Aircraft Systems. 3 Hours.

Course focuses on the fundamentals of UAS operations and the applications of UAS systems in research, government and business applications. Modules covers government compliance, licensing/certification requirements, University Policy and current events in the UAS field. Prepares students to participate in research or UAS operational roles. Discusses policy and process issues in society and considerations for ethical UAS use. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 5933. Cybersecurity for Operations Managers. 3 Hours.

The cybersecurity for operations managers course introduces strategic and tactical processes to implement the National Institute of Standards and Technology (NIST) Risk Management Framework (RMF). Additionally, the Body of Knowledge for the American Society of Industrial Security is applied to each process and procedure. Managers and Leaders responsible for cybersecurity, with or without an IT background, are provided a logical RMF to establish an effective cybersecurity program in their organization. (Typically offered: Fall, Spring and Summer)

OMGT 5983. Advanced Project Management. 3 Hours.

This course builds upon the project management for operations managers' course and offers students an opportunity to apply advanced project management tools to manage troubled projects. Topics include determining the project status using the schedule baseline, cost estimations, and earned value management techniques. Students will learn how to perform a project assessment/audit and will create a troubled project recovery plan. The course includes presentations of case study assignments to gain experience in communicating the status and recovery of failed and troubled projects. Prerequisite: OMT 5783 and must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Fall, Spring and Summer)

OMGT 5993. Homeland Security for Operations Managers. 3 Hours.

Introduces concepts of Homeland Security in industry and government settings. Covers basic legal and compliance programs and risk management processes. Explains the continuity between critical infrastructure, government and private sector roles. Focuses on system design and understanding of the National Incident Management System protecting the homeland. Introduces cybersecurity and intelligence analysis concepts. Prerequisite: Must be admitted to the Master of Science in Operations Management Program, Project Management Graduate Certificate Program, be a Non-Degree Seeking Graduate Student, or have departmental consent. (Typically offered: Irregular)

OMGT 600V. Master's Thesis. 1-6 Hour.

Master's thesis option for OMT students. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

Philosophy (PHIL) Courses

PHIL 5003. Ancient Greek Philosophy. 3 Hours.

(Formerly PHIL 4003.) Pre-Socratics, Socrates, Plato, and Aristotle. Graduate degree credit will not be given for both PHIL 4003 and PHIL 5003. Prerequisite: Three hours of philosophy coursework. (Typically offered: Fall)

PHIL 5013. Platonism and Origin of Christian Theology. 3 Hours.

(Formerly PHIL 4013.) The study of Plato, Middle Platonism, and Neoplatonism, including Philo, Plotinus, and Proclus, and the influence of Platonism on the Greek church fathers of the 2nd-5th centuries, principally Origen and Gregory of Nyssa and also Pseudo-Dionysius. Graduate degree credit will not be given for both PHIL 4013 and PHIL 5013. Prerequisite: Three hours of philosophy coursework. (Typically offered: Irregular)

PHIL 5023. Medieval Philosophy. 3 Hours.

(Formerly PHIL 4023.) Includes Augustine, Bonaventure, Aquinas, Scotus, and Ockham. Graduate degree credit will not be given for both PHIL 4023 and PHIL 5023. (Typically offered: Irregular)

PHIL 5033. Modern Philosophy-17th and 18th Centuries. 3 Hours.

(Formerly PHIL 4033.) British and Continental philosophy, including Bacon, Descartes, Spinoza, Leibniz, Hobbes, Locke, Berkeley, Hume, and Kant. Graduate degree credit will not be given for both PHIL 4033 and PHIL 5033. (Typically offered: Spring)

PHIL 5043. Nineteenth Century Continental Philosophy. 3 Hours.

(Formerly PHIL 4043.) Study of major Continental European philosophers of the 19th century including Hegel, Marx, Kierkegaard, Schopenhauer, Nietzsche. Emphasis on the nature of persons, the question of freedom, and the importance of self-expression, as well as views on knowledge, reality, and the nature of philosophy. Graduate degree credit will not be given for both PHIL 4043 and PHIL 5043. Prerequisite: 3 hours of Philosophy. (Typically offered: Irregular)

PHIL 5063. Twentieth Century Continental Philosophy. 3 Hours.

(Formerly PHIL 4063.) Study of major figures (e.g. Husserl, Heidegger, Sartre, Foucault, Derrida) and trends (phenomenology, existentialism, hermeneutics, critical theory, deconstruction) in 20th century French and German thought. Topics include human beings and their place in the world, the role of history and culture, and the possibility of critical reflection. Graduate degree credit will not be given for both PHIL 4063 and PHIL 5063. (Typically offered: Irregular)

PHIL 5073. History of Analytic Philosophy. 3 Hours.

(Formerly PHIL 4073.) From Frege to recent figures, including Russell, Moore, Wittgenstein, Schlick, Carnap, Ayer, Ryle, Strawson, Quine, including a representative sample of works on the logical analysis of language, logical positivism, and ordinary language analysis. Graduate degree credit will not be given for both PHIL 4073 and PHIL 5073. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5093. Special Topics in Philosophy. 3 Hours.

(Formerly PHIL 4093.) This course will cover subject matter not covered in regularly offered courses. Graduate degree credit will not be given for both PHIL 4093 and PHIL 5093. Course cannot be repeated when topic is the same as one for which the student has been previously enrolled. (Typically offered: Irregular) May be repeated for degree credit.

PHIL 5103. Modern Jewish Thought. 3 Hours.

(Formerly PHIL 4103.) A survey of the main trends in Jewish thought from the seventeenth through the nineteenth century. Graduate degree credit will not be given for both PHIL 4103 and PHIL 5103. (Typically offered: Irregular)

PHIL 5113. Social and Political Philosophy. 3 Hours.

(Formerly PHIL 4113.) Selected philosophical theories of society, the state, social justice, and their connections with individuals. Graduate degree credit will not be given for both PHIL 4113 and PHIL 5113. (Typically offered: Irregular)

PHIL 5123. Classical Ethical Theory. 3 Hours.

(Formerly PHIL 4123.) Study of classical texts in the history of philosophical ethics from Plato to Nietzsche. Philosophers covered may include Plato, Aristotle, Butler, Hume, Kant, and Mill. Graduate degree credit will not be given for both PHIL 4123 and PHIL 5123. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5133. Contemporary Ethical Theory. 3 Hours.

(Formerly PHIL 4133.) A study of contemporary texts in philosophical ethics from G.E. Moore to the present. Philosophers covered may include Moore, Stevenson, Hare, Foot, and Rawls. Graduate degree credit will not be given for both PHIL 4133 and PHIL 5133. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5143. Philosophy of Law. 3 Hours.

(Formerly PHIL 4143.) A philosophical consideration of the nature of law, theory of adjudication, concepts of legal responsibility, liberty and the limits of law, and selected moral-legal issues (abortion, affirmative action, punishment, etc.). Graduate degree credit will not be given for both PHIL 4143 and PHIL 5143. (Typically offered: Irregular)

PHIL 5183. Kant's Critique of Pure Reason. 3 Hours.

(Formerly PHIL 4183.) In his Critique of Pure Reason, one of the most important works in the history of philosophy, Kant describes how the mind works and claims to solve the major problems of metaphysics. The course is aimed at coming to a basic understanding of Kant's thought and at thinking critically about his claims. Graduate degree credit will not be given for both PHIL 4183 and PHIL 5183. (Typically offered: Irregular)

PHIL 5203. Theory of Knowledge. 3 Hours.

(Formerly PHIL 4203.) An examination of skepticism, the nature and structures of knowledge and epistemic justification, human rationality, and the justification of religious belief. Graduate degree credit will not be given for both PHIL 4203 and PHIL 5203. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5213. Philosophy of Science. 3 Hours.

(Formerly PHIL 4213.) Examination of issues related to scientific explanation, empirical foundations of science, observation and objectivity, nature of laws and theories, realism and instrumentalism, induction and confirmation, models, causation, and simplicity, beginning with historical survey set in the context of the history of science but emphasizing works from the 1930s to the current period, often including issues in recent physics. Graduate degree credit will not be given for both PHIL 4213 and PHIL 5213. (Typically offered: Irregular)

PHIL 5233. Philosophy of Language. 3 Hours.

(Formerly PHIL 4233.) A survey of mainstream philosophical theories of meaning, reference, truth, and logical form. Attention given to the views of such figures as Frege, Russell, Tarski, Searle, Dummett, and the advocates of possible world's semantics. Graduate degree credit will not be given for both PHIL 4233 and PHIL 5233. (Typically offered: Irregular)

PHIL 5253. Symbolic Logic I. 3 Hours.

(Formerly PHIL 4253.) Rigorous analyses of the concepts of proof, consistency, equivalence, validity, implication, and truth. Full coverage of truth-functional logic and quantification theory (predicate calculus). Discussion of the nature and limits of mechanical procedures (algorithms) for proving theorems in logic and mathematics. Informal accounts of the basic facts about infinite sets. Graduate degree credit will not be given for both PHIL 4253 and PHIL 5253. Prerequisite: PHIL 2203 or MATH 2603. (Typically offered: Fall)
This course is cross-listed with MATH 5263.

PHIL 5303. Philosophy of Religion. 3 Hours.

(Formerly PHIL 4303.) Types of religious belief and critical examination of their possible validity, including traditional arguments and contemporary questions of meaning. Graduate degree credit will not be given for both PHIL 4303 and PHIL 5303. (Typically offered: Irregular)

PHIL 5313. Contemporary Jewish Thought. 3 Hours.

(Formerly PHIL 4313.) A survey of trends in Jewish thought in the twentieth and twenty-first centuries, focusing on the ways in which Jewish thinkers have responded to the events affecting Jews and the conditions of Jewish life from approximately 1900 to the present. Graduate degree credit will not be given for both PHIL 4313 and PHIL 5313. (Typically offered: Irregular)

PHIL 5403. Philosophy of Art. 3 Hours.

(Formerly PHIL 4403.) Varieties of truth and value in the arts and aesthetic experience, focusing on the creative process in the art and in other human activities. Graduate degree credit will not be given for both PHIL 4403 and PHIL 5403. (Typically offered: Spring)

PHIL 5423. Philosophy of Mind. 3 Hours.

(Formerly PHIL 4423.) An examination of such topics such as the relationship between mind and body, the mentality of machines, knowledge of other minds, the nature of psychological explanation, the relationships between psychology and the other sciences, mental representation, the nature of the self, and free will and determinism. Graduate degree credit will not be given for both PHIL 4423 and PHIL 5423. (Typically offered: Irregular)

PHIL 5603. Metaphysics. 3 Hours.

(Formerly PHIL 4603.) Theory and critical analysis of such basic metaphysical problems as mind and body, universals and particulars, space and time, determinism and free will, self-identity and individualism, with emphasis on contemporary perspectives. Graduate degree credit will not be given for both PHIL 4603 and PHIL 5603. Prerequisite: 3 hours of philosophy. (Typically offered: Irregular)

PHIL 5823. Seminar: Spinoza. 3 Hours.

Seminar: Spinoza (Typically offered: Irregular)

PHIL 5883. Seminar: Wittgenstein. 3 Hours.

Seminar: Wittgenstein (Typically offered: Irregular)

PHIL 5983. Philosophical Seminar. 3 Hours.

Various topics and issues in historical and contemporary philosophy. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

PHIL 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PHIL 690V. Graduate Readings. 1-6 Hour.

Supervised individual readings in historical and contemporary philosophy. (Typically offered: Fall, Spring and Summer)

PHIL 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Physical Education (PHED) Courses

PHED 5243. Sport Skill Assessment and Instructional Strategies. 3 Hours.

The focus of this course is practical assessment techniques and instructional strategies in the area of sport and physical education activities. (Typically offered: Fall and Summer)

PHED 5253. The Physical Education Curriculum. 3 Hours.

Principles, problems, procedures, and the influence of educational philosophy on programs in physical education and their application in the construction of a course of study for a specific situation. (Typically offered: Fall and Summer)

PHED 5273. Professional Issues in Physical Education and Sport. 3 Hours.

A review of contemporary research literature informing effective teaching practices in physical education settings. Students gain experience in critically reviewing literature and discussing current issues. (Typically offered: Fall and Summer)

PHED 5313. Risk Management in Physical Education & Athletics. 3 Hours.

This course is designed to provide opportunities for the student to acquire an understanding of how to reduce the risk of injuries and eliminate hazards that may contribute to injuries associated with physical education and athletics. (Typically offered: Spring and Summer)

PHED 5483. Conducting Research in Physical Education. 3 Hours.

Methods and techniques of research in physical education, including an analysis of examples of their use and practice in their application to problems of interest to the student. Prerequisite: Students must be currently enrolled in the online MEd in Physical Education program. (Typically offered: Fall, Spring and Summer)

PHED 5553. Scientific Principles of Movement and Performance. 3 Hours.

This course focuses on theoretical information about sport biomechanics and movement principles, with practical applications to the physical education of coaching profession. (Typically offered: Spring and Summer)

PHED 5643. Motor Learning. 3 Hours.

Concepts of motor learning and control are presented. Attention is given to an analysis of the literature in movement control, motor behavior, and motor learning. (Typically offered: Fall and Spring)

PHED 5753. Sport Psychology. 3 Hours.

Investigation of historical and contemporary research in sport psychology. (Typically offered: Spring and Summer)

PHED 5803. Measurement Concepts for K-12 Physical Education Teachers. 3 Hours.

This course focuses on techniques that physical education teachers can use to monitor student progress in a K-12 environment. (Typically offered: Spring and Summer)

PHED 6363. Supervision in Physical Education. 3 Hours.

The focus of this course is instructional supervision as a set of complex processes in which the supervisor works within accepted guidelines and functions to effectively supervise a teacher's pedagogical development. The Physical Education Instructional Supervision (PEIS) Model will be used to help facilitate this process. (Typically offered: Fall and Spring)

PHED 6723. Project Implementation and Data Analysis. 3 Hours.

This course is designed to provide students with the tools to identify, develop, and submit grant proposals. (Typically offered: Fall and Spring)

Physics (PHYS) Courses

PHYS 500V. Laboratory and Classroom Practices in Physics. 1-3 Hour.

The pedagogy of curricular materials. Laboratory and demonstration techniques illustrating fundamental concepts acquired through participation in the classroom as an apprentice teacher. (Typically offered: Fall) May be repeated for up to 3 hours of degree credit.

PHYS 5011. Introduction to Current Physics Research Seminar. 1 Hour.

This seminar course introduces new Physics graduate students to the faculty of the Physics department and their current research efforts. In addition, the students will be introduced to scientific ethics, and learn communication skills. (Typically offered: Fall)

PHYS 502V. Individual Study in Advanced Physics. 1-4 Hour.

Guided study in current literature. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

PHYS 5041. Journal Club Seminar. 1 Hour.

In this seminar, the students will present talks based on published research articles. The goal of the course is to develop oral communication skills in the students. Effective literature search techniques will also be covered. (Typically offered: Spring)

PHYS 5073. Mathematical Methods for Physics. 3 Hours.

This course merges the mathematics required in classical mechanics, electrostatics, magnetostatics, and quantum mechanics into a single course. The goal is to develop physics problem-solving skills, a strong mathematical foundation, and a more unified picture of physics. (Typically offered: Fall)

PHYS 5083. Mathematical Methods of Physics II. 3 Hours.

Applications of matrices, tensors, and linear vector spaces to problems in physics. Introduction to groups and their representations, and symmetry principles in modern physics. Prerequisite: PHYS 5073. (Typically offered: Irregular)

PHYS 5093. Applications of Group Theory to Physics. 3 Hours.

Application of group theory to topics in physics, especially to atomic/molecular and solid-state physics. Prerequisite: PHYS 5073. (Typically offered: Irregular)

PHYS 5103. Advanced Mechanics. 3 Hours.

Dynamics of particles and rigid bodies. Hamilton's equations and canonical variables. Canonical transformations. Small oscillations. Prerequisite: PHYS 5073. (Typically offered: Fall)

PHYS 5111. Research Techniques Through Laboratory Rotations. 1 Hour.

Graduate students will be introduced to detailed operational aspects of two Physics research laboratories through extensive observation of those laboratory's operations during a six week rotation through each lab. Planning for starting a research project in the summer will take place in the final three week rotation period. (Typically offered: Spring)

PHYS 5213. Statistical Mechanics. 3 Hours.

Classical and quantum mechanical statistical theories of matter and radiation.

Prerequisite: PHYS 5413. (Typically offered: Spring)

PHYS 5263L. Experiment and Data Analysis. 3 Hours.

This course is devoted to learning some of the frequently used experimental techniques and methods by which experimental data are analyzed to extract quantitative information on physical parameters. Students will perform experiments, analyze data, and write lab reports. Pre- or Corequisite: PHYS 5423. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall)

PHYS 5313. Advanced Electromagnetic Theory I. 3 Hours.

Electrostatics, boundary-value problems in electrostatics, electrostatics in a medium, magnetostatics, and Faraday's Law. (Typically offered: Spring)

PHYS 5323. Advanced Electromagnetic Theory II. 3 Hours.

Maxwell equations, conservation laws, wave propagation, waveguides, radiating systems, scattering, special relativity, and radiation by moving charges. (Typically offered: Fall)

PHYS 5363. Scientific Computation and Numerical Methods. 3 Hours.

An introduction to numerical methods used in solving various problems in engineering and the sciences. May not earn credit for this course and MATH 4353 or MATH 4363. (Typically offered: Fall Even Years)

This course is cross-listed with MATH 5363.

PHYS 5413. Quantum Mechanics I. 3 Hours.

Non-relativistic quantum mechanics; the Schrodinger equation; the Heisenberg matrix representation; operator formalism; transformation theory; spinors and Pauli theory; the Dirac equation; applications to atoms and molecules; collision theory; and semiclassical theory of radiation. (Typically offered: Fall)

PHYS 5423. Quantum Mechanics II. 3 Hours.

Continuation of PHYS 5413 Prerequisite: PHYS 5413. (Typically offered: Spring)

PHYS 5513. Atomic and Molecular Physics. 3 Hours.

Survey of atomic and molecular physics with emphasis on the electronic structure and spectroscopy of 1 and 2 electron atoms and diatomic molecules. Includes fine and hyperfine structure, Zeeman and Stark mixing of states, collision phenomena, radiative lifetimes, and experimental techniques. Prerequisite: PHYS 5413. (Typically offered: Irregular)

PHYS 5613. Introduction to Biophysics and Biophysical Techniques. 3 Hours.

Origins of biophysics, biological polymers and polymer physics, properties of DNA and proteins, techniques to study DNA and proteins, biological membrane and ion channels, biological energy, experimental techniques to study single DNA and proteins. Two experiments are included: (1) DNA Gel electrophoresis; (2) Measurement of double-stranded DNA melting point. (Typically offered: Spring)

PHYS 5653. Subatomic Physics. 3 Hours.

Nuclear structure and nuclear reactions. Nature and properties of elementary particles and resonances, their interactions and decays. Phenomenological theory and discussion of experimental evidence. (Typically offered: Fall Odd Years)

PHYS 5713. Condensed Matter Physics I. 3 Hours.

The course covers the Drude theory and the Sommerfeld theory of metals, crystal lattices, reciprocal lattices, X-ray diffraction, Bloch's theory of electrons in periodic potential, formation of band gap, lattice vibration, and cohesive energy in solids. Prerequisite: PHYS 5413. (Typically offered: Fall)

PHYS 5723. Physics at the Nanoscale. 3 Hours.

This is a cross-disciplinary course that is focused on teaching nanoscience and engineering by studying surface science, the building and analysis of quantum-confined structures, and related nano manufacturing processes. Students will achieve an integrated knowledge of the concepts of surface science, quantum mechanics, nano processing and manipulation, and techniques of materials research. (Typically offered: Irregular)

PHYS 5734. Laser Physics. 4 Hours.

A combined lecture/laboratory course covering the theory of laser operation, laser resonators, propagation of laser beams, specific lasers such as gas, solid state, semiconductor and chemical lasers, and laser applications. (Typically offered: Spring Odd Years)

PHYS 5753. Applied Nonlinear Optics. 3 Hours.

Topics include: practical optical processes, such as electro-optic effects, acousto-optic effects, narrow-band optical filters, second harmonic generation, parametric amplification and oscillation, and other types of nonlinear optical spectroscopy techniques which are finding current practical applications in industry. (Typically offered: Irregular)

PHYS 5763. Experimental Methods for Nanoscience. 3 Hours.

Fundamentals of the selected techniques suitable for characterization on the nanoscale. Focus on diverse methods such as x-ray and neutron spectroscopy, scanning probe microscopies, optical methods, electron diffraction methods and more. (Typically offered: Irregular)

PHYS 5773. Introduction to Optical Properties of Materials. 3 Hours.

This course covers crystal symmetry optical transmission and absorption, light scattering (Raman and Brillouin) optical constants, carrier mobility, and polarization effects in semi-conductors, quantum wells, insulators, and other optically important materials. (Typically offered: Spring Even Years)

PHYS 5783. Physics of 2D Materials. 3 Hours.

Introduction to the structures of all known layered materials, followed by mechanical, electronic, spin, optical, and topological properties of two-dimensional materials. Discussion of theoretical concepts and examination of experimental manifestations of those concepts are interwoven throughout the semester. Knowledge of solid state physics is required. Pre- or Corequisite: PHYS 5413. (Typically offered: Fall Odd Years)

PHYS 588V. Selected Topics in Physics. 1-3 Hour.

Selected topics in experimental or theoretical physics at the advanced level. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

PHYS 600V. Master of Science Thesis. 1-6 Hour.

Master of Science Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PHYS 6513. Theoretical Biophysics. 3 Hours.

Introduction to biology as a complex system, networks and information theory, negative and positive feedback systems, gene regulation, noise, and noise propagation, cell signaling pathways, intercellular interactions, and emergence of cooperativity in biological systems. Prerequisite: PHYS 5613. (Typically offered: Fall Even Years)

PHYS 6613. Quantum Optics. 3 Hours.

Properties of light and its interaction with atoms, particular attention given to the laser and recent experiments. Classical theory of resonance; Optical Bloch Eqs.; 2 level atoms in steady fields; pulse propagation; semiclassical theory of the laser, coherent states and coherent functions; gas, solid, and dye lasers; photon echoes and superradiance; quantum electrodynamics and spontaneous emission. Prerequisite: PHYS 5413 or equivalent. (Typically offered: Irregular)

PHYS 6713. Condensed Matter Physics II. 3 Hours.

The course covers surface physics, physics of homogeneous and inhomogeneous semiconductors, dielectric and ferroelectric physics, defects in crystals, spin interaction and magnetic properties, superconductivity, and band structure calculation. Prerequisite: PHYS 5713 and PHYS 5413. (Typically offered: Spring Even Years)

PHYS 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Plant Pathology (PLPA) Courses

PLPA 5001. Seminar. 1 Hour.

Review of scientific literature and oral reports on current research in plant pathology. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

PLPA 502V. Special Problems Research. 1-6 Hour.

Original investigations of assigned problems in plant pathology. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLPA 504V. Special Topics. 1-18 Hour.

Lecture topics of current interest not covered in other courses in plant pathology or other related areas. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

PLPA 5123. Bacterial Lifestyles. 3 Hours.

The course will introduce students to bacteria as prokaryotic organisms, different from eukaryotes such as plants and animals. Model microbial systems will be studied in more detail to identify unique strategies that bacteria employ to thrive in their respective environment, whether they are causing diseases or establishing beneficial interactions with animal or plants or coexisting with other microorganisms in diverse ecological environments. The course will also cover special adaptations that bacteria have evolved to adapt to harsh environments and how these adaptations can be harnessed to control pollution. Prerequisite: (BIOL 2013 and BIOL 2011L) or BIOL 3123. (Typically offered: Spring Odd Years) This course is cross-listed with BIOL 5223.

PLPA 5223. Plant Disease Control. 3 Hours.

(Formerly PLPA 4223.) Principles, methods and mechanics of plant disease control. Emphasis is given to the integration of control measures and epidemiology of plant diseases. Lecture 3 hours per week. Graduate degree credit will not be given for both PLPA 4223 and PLPA 5223. (Typically offered: Fall)

PLPA 5303. Advanced Plant Pathology: Host-Pathogen Interactions. 3 Hours.

Presentation of important contemporary concepts relative to disease resistance and the physiology, biochemistry, and molecular biology of plant-pathogen interactions. Lecture 3 hours per week. Prerequisite: PLPA 3003 or equivalent and graduate standing. (Typically offered: Spring Odd Years)

PLPA 5313. Advanced Plant Pathology: Ecology and Epidemiology. 3 Hours.

Presentation of important contemporary concepts relative to the ecology and epidemiology of foliar and soil-borne plant pathogens. Lecture 3 hours per week. Prerequisite: PLPA 3003 and graduate standing. (Typically offered: Spring Even Years)

PLPA 5324. Applied Plant Disease Management. 4 Hours.

(Formerly PLPA 4304.) A plant pathology course emphasizing practical understanding of the concepts and principles of agronomic and horticultural crop disease management, including disease diagnosis, monitoring, and using models to forecast disease events. Graduate degree credit will not be given for both PLPA 4304 and PLPA 5324. (Typically offered: Irregular)

PLPA 5333. Biotechnology in Agriculture. 3 Hours.

(Formerly PLPA 4333.) Discussion of the techniques, applications, and issues of biotechnology as it is being used in modern agriculture. Coverage includes the basics of molecular biology, production of transgenic plants and animals, and new applications in the agricultural, food, and medical marketplace. Lecture and discussion, 3 hours per week. Graduate degree credit will not be given for both PLPA 4333 and PLPA 5333. (Typically offered: Fall)

PLPA 5404. Diseases of Economic Crops. 4 Hours.

Diagnosis and management of important diseases of cotton, fruits, rice, trees, soybeans, wheat, and vegetables will be covered in a lecture, laboratory, and field format. Lecture 2 hours, laboratory 4 hours per week. Four 1-day field trips will be involved. Corequisite: Lab component. Prerequisite: PLPA 3003. (Typically offered: Summer)

PLPA 5603. Plant Pathogenic Fungi. 3 Hours.

Plant Pathogenic Fungi is structured as an integrated lecture/laboratory class designed for students that are interested in developing an understanding and appreciation for taxonomy, biology, and ecology of plant pathogenic fungi and related saprophytic fungi. Corequisite: Lab component. Prerequisite: PLPA 3003 or BIOL 4424 or graduate standing. (Typically offered: Fall Odd Years)

PLPA 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PLPA 6203. Plant Virology. 3 Hours.

Lecture emphasizing discussion of recent advances in plant virology. Laboratory concerned with techniques and equipment used in plant virus studies, including transmission of viruses, characterization utilizing ultracentrifugation, spectrophotometry, electrophoresis, electron microscopy, and serology. Lecture 2 hours, laboratory 3 hours per week. Corequisite: Lab component. Prerequisite: CHEM 5813 or CHEM 5843 or CHEM 6873 or consent of instructor. (Typically offered: Fall Even Years)

PLPA 6503. Plant Bacteriology. 3 Hours.

Current concepts and techniques in plant bacteriology, including taxonomic, ecological and molecular aspects of plant pathogenic bacteria and their interactions with hosts. Lecture 2 hours, laboratory 2 hours per weeks. Corequisite: Lab component. Prerequisite: BIOL 2013 and BIOL 2011L. (Typically offered: Spring Odd Years) May be repeated for up to 3 hours of degree credit.

Plant Sciences (PTSC) Courses

PTSC 6101. Colloquium in Plant Sciences. 1 Hour.

Advanced discussion of topics in plant science on a participatory basis. Topics in plant pathology, horticulture and forestry will be treated. Prerequisite: Graduate standing. (Typically offered: Spring) May be repeated for up to 2 hours of degree credit.

PTSC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Political Science (PLSC) Courses

PLSC 500V. Special Topics. 1-3 Hour.

(Formerly PLSC 400V.) Topics in political science not usually covered in other courses. Graduate degree credit will not be given for both PLSC 400V and PLSC 500V. (Typically offered: Irregular) May be repeated for degree credit.

PLSC 5043. The U.S. Constitution I. 3 Hours.

(Formerly PLSC 4253.) United States Supreme Court decisions involving the functions and powers of Congress, the Supreme Court, and the President and federalism. Graduate degree credit will not be given for both PLSC 4253 and PLSC 5043. Prerequisite: PLSC 2003. (Typically offered: Spring)

PLSC 5053. Creating Democracies. 3 Hours.

(Formerly PLSC 4513.) Analyses of the creation of democracies in Europe, South America, Asia, Africa, the Middle East, East Europe, and the former Soviet Union. Graduate degree credit will not be given for both PLSC 4513 and PLSC 5053. Prerequisite: PLSC 2013. (Typically offered: Fall Even Years)

PLSC 5083. The Middle East in World Affairs. 3 Hours.

An analysis of geo-political and socio-economic characteristics of Middle Eastern societies and their impact on world economic and political order. Special attention to such issues as the Arab-Israeli conflict, the promotion of lasting peace in the region, impact of oil on world politics, the involvement of superpowers, rehabilitation of Palestinian refugees and the role of the United Nations. (Typically offered: Spring)

PLSC 5103. Human Behavior in Complex Organizations. 3 Hours.

Review of the fundamental literature and a systematic analysis of various theories and research focusing on organization and behavior in public administration, including the discussion of organizational development, human motivation, leadership, rationality, efficiency and conflict management in public organizations. Prerequisite: Graduate standing. (Typically offered: Spring Odd Years; Summer)

PLSC 5113. Seminar in Human Resource Management. 3 Hours.

Intensive study of public personnel policies and practices, including legal foundations, classification and compensation plans, recruitment and selection processes, training, employment policies and morale, employee relations and organization. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5123. Public Budgeting and Finance. 3 Hours.

Focuses on the budgeting process and governmental fiscal policy formulation, adoption, and execution. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5133. Nonprofit Management. 3 Hours.

This course provides an overview of the principal management functions in public and nonprofit organizations. Topics include financial management, HR development, program development. The relationships among volunteer boards of trustees, fund raising, public relations, and program personnel are analyzed, and the complex environments with service sector agencies are explored. (Typically offered: Fall)

PLSC 5143. Administrative Law. 3 Hours.

A seminar which examines the constitutional and statutory basis and authority of public organizations. Special attention focuses on the nature of the rule-making and adjudicatory powers of public agencies and on executive, legislative, and judicial restraints on such activities. Also considered are the role, scope, and place of public regulatory activities. Prerequisite: Graduate standing. (Typically offered: Spring)

PLSC 5163. Public Policy. 3 Hours.

Seminar examining the study of public policy making in complex organizations. Attention given to different theories and frameworks explaining public policy making. Prerequisite: Graduate standing. (Typically offered: Spring)

PLSC 5173. Community Development. 3 Hours.

Community development encompasses the political, social, and economic issues that shape contemporary communities. The seminar examines substantive issues in community development, related theories, and techniques. A major focus of the course will be on low-income and minority neighborhoods and efforts to create more inclusive communities in the U.S. and abroad. (Typically offered: Fall)

PLSC 5193. Seminar in Public Administration. 3 Hours.

Introduction to and synthesis of public administration theory, functions, history, public accountability and management concerns, economic impact of administrative decisions, current problems, and issues in the public sector. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5203. Seminar in American Political Institutions. 3 Hours.

Research seminar dealing with selected aspects of the major governmental institutions in the United States. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5213. Seminar in American Political Behavior. 3 Hours.

Reading seminar surveying major works on representative processes in American national politics, including political opinion, political leadership, political participation, voting behavior, political parties, and interest groups. Prerequisite: Graduate standing. (Typically offered: Spring)

PLSC 5233. The American Chief Executive. 3 Hours.

Study of the origin, background, and evolution of the Office of the President of the United States, with a review of the president's powers in the areas of politics, administration, and legislation. (Typically offered: Spring Odd Years)

PLSC 5243. Seminar in State Politics and Policy. 3 Hours.

Research seminar dealing with selected aspects of state political institutions and politics such as policy diffusion, institutional professionalization, and representation. Prerequisite: Graduate standing. (Typically offered: Fall Even Years)

PLSC 5253. Politics of Race and Ethnicity. 3 Hours.

Reviews identity, political action and concepts of political activity by minority groups, focusing on contemporary political behavior, the incorporation of minority groups into the U.S. political system. (Typically offered: Irregular)

PLSC 5273. The U.S. Constitution I. 3 Hours.

United States Supreme Court Decisions involving the functions and powers of Congress, the Supreme Court and the President and federalism. (Typically offered: Spring)

PLSC 5283. Federalism and Intergovernmental Relations. 3 Hours.

(Formerly PLSC 4283.) Analysis of changes in intergovernmental relations in the American federal system. Discussions will focus on political, economic/fiscal and administrative aspects of policy changes of the pre-and post-Reagan eras. Graduate degree credit will not be given for both PLSC 4283 and PLSC 5283. (Typically offered: Spring Even Years)

PLSC 5343. Money and Politics. 3 Hours.

Familiarizes students with the world of money and politics in the United States. Examines the function of money in elections, the legal aspects, and the consequences of the regulatory environment. Provides a means to gain analytic computer skills and a strong foundation for further study of political science. (Typically offered: Fall)

PLSC 5373. Political Communication. 3 Hours.

(Formerly PLSC 4373.) Study of the nature and function of the communication process as it operates in the political environment. Graduate degree credit will not be given for both PLSC 4373 and PLSC 5373. (Typically offered: Spring Even Years)

PLSC 5383. Seminar in Political Communication. 3 Hours.

Research seminar focusing on selected topics such as candidate imagery, diffusion of political information, or political symbolism. Prerequisite: Graduate standing. (Typically offered: Irregular)

This course is cross-listed with COMM 5383.

PLSC 5503. Comparative Political Analysis. 3 Hours.

A selection of topics to provide the theoretical, conceptual and methodological and foundation for the analysis of contemporary political systems. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5513. Seminar in Politics of the Middle East. 3 Hours.

Explores the major lines of inquiry on the politics of the state and society in the context of endogenous and exogenous forces that have influenced conceptions of power, legitimacy, and identity. Prerequisite: Graduate standing. (Typically offered: Irregular)

PLSC 5563. Government and Politics of Russia. 3 Hours.

(Formerly PLSC 4563.) Study of Russian and Soviet politics after 1917 and of the democratization of Russia and the other successor states. Graduate degree credit will not be given for both PLSC 4563 and PLSC 5563. Prerequisite: PLSC 2003 or PLSC 2013. (Typically offered: Spring Even Years)

PLSC 5583. Political Economy of East Asia. 3 Hours.

(Formerly PLSC 4583.) Development strategies and policies of major economies in East Asia. Topics include theories for East Asia's economic growth, dynamics and process of East Asian political and economic developments, strengths and limits of the East Asian development model, Asian values and their implications for Asian-style democracy, and dynamics of regional cooperation. Graduate degree credit will not be given for both PLSC 4583 and PLSC 5583. (Typically offered: Spring)

PLSC 5593. Islam and Politics. 3 Hours.

Compares contemporary Islamist political movements. Seeks to explain causes, debates, agendas, and strategies of Islamists in the political realm. Addresses sovereignty, the rule of law, visions of the good state and society, and relations between nationalism, religion and political development. Focus on Middle East with comparative reference to other cases. (Typically offered: Fall)

PLSC 5703. Research Design in Political Science and Public Policy. 3 Hours.

This course is designed to introduce graduate students to fundamental research issues in the realm of applied social science while developing the ability to apply basic skills for conducting research. (Typically offered: Fall)

PLSC 5803. Seminar in International Politics. 3 Hours.

Research seminar providing intensive coverage of selected topics in theories of international relations, the comparative study of foreign policy making, and international organizations. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5823. Qualitative Methods in Political Science. 3 Hours.

Develops expertise in qualitative research methods, including when such methods are appropriate, the benefits and drawbacks, and how to distinguish between strong and weak research questions. (Typically offered: Spring Even Years)

PLSC 5833. International Political Economy. 3 Hours.

Seminar with concentrated reading in selected and specialized areas of contemporary international relations. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5843. International Legal Order. 3 Hours.

Analysis of distinctive characteristics of contemporary international law. Topics include role of legal order in controlling the use of force in international relations and the impact of social and political environment on growth of international law and relations among international political systems. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 5863. Political Psychology and International Relations. 3 Hours.

Examines psychological approaches to international relations and examines how these perspectives advance the study of world politics. (Typically offered: Irregular)

PLSC 5873. Inter-American Politics. 3 Hours.

An analysis of the political themes, regional organization, and hemispheric relations that constitute the inter-American system, with special emphasis on conflict and cooperation in the hemispheric policies of the American republics. (Typically offered: Irregular)

PLSC 5883. Politics of International Law. 3 Hours.

This course examines the interaction between law and politics in the international system, focusing on international law. (Typically offered: Irregular)

PLSC 590V. Directed Readings in Political Science. 1-3 Hour.

Directed readings in Political Science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLSC 5913. Research Methods in Political Science. 3 Hours.

Methods relevant to research in the various fields of political science. Required of all graduate students in political science. Prerequisite: Graduate standing. (Typically offered: Fall)

PLSC 592V. Internship in Political Science. 1-6 Hour.

Internship in a local, state, regional, or federal agency. Paper required on a significant aspect of internship experience. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

PLSC 5943. Advanced Research Methods in Political Science. 3 Hours.

Provides a firm theoretical foundation in, and an ability to apply, various multivariate statistical methods that are most commonly used for empirical analysis of politics and policy. Prerequisite: PLSC 5913 or equivalent. (Typically offered: Fall)

PLSC 595V. Research Problems in Political Science. 1-3 Hour.

Research problems in Political Science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PLSC 5983. Mixed Methods Research Design. 3 Hours.

An advanced overview of a particular type of multi-point research design. Mixed methods research combines quantitative and qualitative research strategies in a single research project. (Typically offered: Spring)

PLSC 5993. African American Political Ideology. 3 Hours.

A survey course designed to identify and examine characteristics and functions of several variants of black political ideology/thought. (Typically offered: Spring Odd Years)

PLSC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PLSC 6963. Visualizing Critical Race Theory. 3 Hours.

An examination of critical theoretical approaches to the concepts of race and racism. Students will examine the ways in which these constructs perform a critical function in the construction of race(s) and racism(s) and their relevance to visual culture. (Typically offered: Fall and Spring)

This course is cross-listed with ARED 6963, AAST 6963.

Poultry Science (POSC) Courses

POSC 500V. Special Problems. 1-6 Hour.

Work in special problems of poultry industry. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

POSC 5033. Statistical Process Control in the Food Industry. 3 Hours.

(Formerly POSC 4033.) Analysis of processing data related to compliance with regulatory limits, quality and safety limits and internal and external customer specifications. Emphasizes statistical process control chart development, including understanding data and chart selection, calculating statistical limits, and interpreting process performance. Graduate degree credit will not be given for both POSC 4033 and POSC 5033. Prerequisite: Instructor consent. (Typically offered: Irregular)

POSC 510V. Special Topics in Poultry Sciences. 1-4 Hour.

Topics not covered in other courses or a more intensive study of specific topics in poultry science. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

POSC 5113. Food Toxicology and Contaminants. 3 Hours.

During this course, the student will learn basic concepts of food toxicology, study the different physiological processes involved in food borne intoxications, and learn about potential health problems associated with exposure to these compounds. Prerequisite: Graduate study. (Typically offered: Irregular)

POSC 5123. Advanced Animal Genetics. 3 Hours.

Specialized study of animal genetics. Lecture 3 hours per week. Prerequisite: POSC 3123 or ANSC 3123. (Typically offered: Fall Even Years)
This course is cross-listed with ANSC 5123.

POSC 5143. Biochemical Nutrition. 3 Hours.

Interrelationship of nutrition and physiological chemistry; structure and metabolism of physiological significant carbohydrates, lipids, and proteins; integration of metabolism with provision of tissue fuels; specie differences in regulatory control of tissue and whole body metabolism of nutrients. Prerequisite: CHEM 3813. (Typically offered: Fall Even Years)

This course is cross-listed with ANSC 5143.

POSC 5152. Protein and Amino Acid Nutrition. 2 Hours.

Students will be introduced to the basic processes of protein digestion, amino acid absorption, transport, metabolism, and utilization along with how biochemical function of proteins and their dynamic state affect nutritional status for animals and man. Prerequisite: CHEM 3813. (Typically offered: Spring Even Years)

This course is cross-listed with ANSC 5152.

POSC 5163. Companion Animal Nutrition. 3 Hours.

This course is designed to focus on the digestive anatomy, physiology, and nutrient metabolism of non-herbivorous companion animals, primarily dogs and cats. Topics discussed will also include an overview of the pet food industry, its regulations and commonly utilized ingredients. Students will gain a deeper understanding of nutrition as it relates to life stages and various disease states that can affect both dogs and cats. This course will require a Saturday trip to one or two off campus facilities. Prerequisite: ANSC 3143 or POSC 4343. (Typically offered: Spring)

This course is cross-listed with ANSC 5163.

POSC 5213. Integrated Poultry Management Systems. 3 Hours.

(Formerly POSC 4213.) Major managerial systems in the integrated commercial poultry industry. Development of an understanding of the basic decision making processes of poultry companies and the factors influencing those decisions. Graduate degree credit will not be given for both POSC 4213 and POSC 5213. Prerequisite: POSC 2353 and AGECE 1103 and AGECE 2303. (Typically offered: Fall)

POSC 5233. Value Added Muscle Foods. 3 Hours.

An intense study of muscle structure and how it relates to the development of further processed meat products. Muscle ultrastructure, protein functionality, product development, and quality analysis will be covered. In class hands on activities will also be included to allow students to obtain experience of producing processed meat products. (Typically offered: Spring Even Years)

POSC 5243. Legal Issues in Animal Agriculture. 3 Hours.

(Formerly POSC 4123.) An issues-oriented course focusing on the legal issues involved in the production of poultry, swine and livestock. Emphasis will center on the laws, regulations and policy arguments involved in animal confinement, antibiotic use, humane slaughter and veterinary medicine, along with other related issues. The wide range of regulation from local to state to federal, depending on the issue will be studied and discussed. Graduate degree credit will not be given for both POSC 4123 and POSC 5243. (Typically offered: Spring Odd Years)

POSC 5254. Egg and Meat Technology. 4 Hours.

(Formerly POSC 4314.) Study of the science and practice of processing poultry meat and egg products; examination of the physical, chemical, functional and microbiological characteristics of value added poultry products; factors affecting consumer acceptance and marketing of poultry products and the efficiency of production. Graduate degree credit will not be given for both POSC 4314 and POSC 5254. Corequisite: Lab component. Prerequisite: (CHEM 1123 and CHEM 1121L) or (CHEM 1073 and CHEM 1071L) and BIOL 1543 and BIOL 1541L. (Typically offered: Fall)

POSC 5313. Domestic Animal Bacteriology. 3 Hours.

A study of bacteria pathogenic for domestic animals. Lecture 3 hours per week. (Typically offered: Fall)

POSC 5333. Poultry Breeding. 3 Hours.

(Formerly POSC 4333.) Application of new developments in poultry breeding for efficient egg and meat production. Not intended for students interested in a career in veterinary sciences. Lecture 3 hours per week. Graduate degree credit will not be given for both POSC 4333 and POSC 5333. (Typically offered: Fall Odd Years)

POSC 5343. Advanced Immunology. 3 Hours.

Aspects of innate, cell-mediated, and humoral immunity in mammalian and avian species. Molecular mechanisms underlying the function of the immune system are emphasized. A course in Basic Immunology prior to enrollment in Advanced Immunology is recommended but not required. Lecture 3 hours per week. (Typically offered: Spring)

This course is cross-listed with BIOL 5343.

POSC 5352L. Immunology in the Laboratory. 2 Hours.

Laboratory course on immune-diagnostic laboratory techniques and uses of antibodies as a research tool. Included are cell isolation and characterization procedures, immunochemistry, flow cytometry, ELISA and cell culture assay systems. Laboratory 6 hours per week. Prerequisite: POSC 5343 or BIOL 5343 or BIOL 4713. (Typically offered: Spring)

This course is cross-listed with BIOL 5352L.

POSC 5443. Poultry Nutrition. 3 Hours.

(Formerly POSC 4343.) Principles of nutrition as applied to the formulation of practical chicken and turkey rations. Lecture 3 hours per week. Graduate degree credit will not be given for both POSC 4343 and POSC 5443. Prerequisite: CHEM 2613 or CHEM 3603. (Typically offered: Spring)

POSC 5742. Advanced Poultry Diseases. 2 Hours.

An in-depth coverage of the most important diseases of poultry with a focus on understanding mechanisms of pathogenesis, diagnostic techniques and principles of prevention. Lecture/discussion 2 hours per week. Prerequisite: POSC 3223. (Typically offered: Spring Odd Years)

POSC 5743L. Advanced Analytical Methods in Animal Sciences Laboratory. 3 Hours.

Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. (Typically offered: Fall)

This course is cross-listed with ANSC 5743L.

POSC 5873. Molecular Analysis of Foodborne Pathogens. 3 Hours.

Course topics will include molecular detection and identification of foodborne pathogens, the molecular response of foodborne pathogens to their environments, functional genomic approaches, and analysis of complex microbial communities. Lecture/discussion 3 hours per week. (Typically offered: Fall)

POSC 5901. Graduate Seminar. 1 Hour.

Critical review of the current scientific literature pertaining to the field of poultry science. Oral reports. Recitation 1 hour per week. Prerequisite: Senior standing. (Typically offered: Fall and Spring)

POSC 5923. Brain and Behavior. 3 Hours.

Covers cellular through neural systems, major brain functions and comparative neuroanatomy. Topics include ion channels, membrane and action potentials, synaptic integration, neurotransmitters, major brain regions of mammals and birds, sensory and autonomic nervous systems, neuroendocrine system, and control by the brain of critical functions and behavior. Lecture 3 hours per week. Prerequisite: (ANSC 3033 or POSC 3033) or PSYC 2003 or BIOL 2213 or BIOL 2443 or BIOL 2533. (Typically offered: Fall)

This course is cross-listed with ANSC 5923.

POSC 5932. Cardiovascular Physiology of Domestic Animals. 2 Hours.

Cardiovascular physiology, including mechanisms of heart function and excitation, and blood vessel mechanisms associated with the circulatory system in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall) This course is cross-listed with ANSC 5932.

POSC 5942. Endocrine Physiology of Domestic Animals. 2 Hours.

Endocrine physiology, including mechanisms of hormone secretion, function, and regulation. Mechanisms associated with the endocrine system will be discussed for domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall) This course is cross-listed with ANSC 5942.

POSC 5952. Respiratory Physiology of Domestic Animals. 2 Hours.

Respiratory physiology, including mechanisms of lung function and gas exchange. Mechanisms associated with the interaction of the respiratory system with other bodily systems in domestic animals and poultry will be discussed. Lecture 3 hours; drill 1 hour per week for first 8 weeks of semester. Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Spring) This course is cross-listed with ANSC 5952.

POSC 5962. Gastrointestinal/Digestive Physiology of Domestic Animals. 2 Hours.

Gastrointestinal and hepatic physiology, including mechanisms of digestion, absorption of nutrients with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Fall) This course is cross-listed with ANSC 5962.

POSC 5972. Renal Physiology of Domestic Animals. 2 Hours.

Renal physiology, including mechanisms of renal clearance with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for second 8 weeks of semester). Pre- or Corequisite: CHEM 3813. Corequisite: Drill component. Prerequisite: ANSC 3033 or POSC 3033. (Typically offered: Spring) This course is cross-listed with ANSC 5972.

POSC 600V. Thesis. 1-6 Hour.

Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

POSC 6123. Advanced Food Animal Wellbeing. 3 Hours.

Advances in fundamentals of animal welfare including animal health, animal handling, food safety and productivity. Prerequisite: Instructor consent. (Typically offered: Spring) This course is cross-listed with ANSC 6123.

POSC 6343. Vitamin Nutrition in Domestic Animals. 3 Hours.

The vitamins required by domestic animals with emphasis upon their role in animal nutrition, physiological functions, and consequences of failure to meet the requirement of the animal. Lecture 3 hours per week. Prerequisite: (ANSC 3143 or POSC 4343) and CHEM 3813. (Typically offered: Spring Even Years) This course is cross-listed with ANSC 6343.

POSC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Psychology (PSYC)

Courses

PSYC 5013. Advanced Developmental Psychology. 3 Hours.

Critical examination of the research relevant to the psychological factors influencing the growth processes of the individual from birth to maturity. (Typically offered: Spring)

PSYC 5033. Psychopathology Theory & Assessment. 3 Hours.

Psychological and somatic factors contributing to pathological behavior. Interrelations of these factors will be analyzed in terms of how they lead to differential abnormal states. Includes guidelines for using structured interviews in the diagnosis and clinical assessment of major psychological disorders. Prerequisite: PSYC 3023 and enrollment in the Graduate Program in Psychology, or instructor consent. (Typically offered: Fall)

PSYC 5043. Assessment of Intellectual and Cognitive Abilities. 3 Hours.

Training in the theory, administration and interpretation of individual tests of intelligence and mental ability. Prerequisite: PSYC 4053 and enrollment in the Psychology Graduate Program. (Typically offered: Fall)

PSYC 5063. Advanced Social Psychology. 3 Hours.

Theory, methodology, and contemporary research in the major areas of social psychology. Topics include attitude theory and measurement, group processes, social and cultural factors. (Typically offered: Spring)

PSYC 5073. Introduction to Clinical Practice: Core Skills and Ethical Guidelines. 3 Hours.

An introduction to clinical practice focusing on a) interview methods and techniques and b) ethical principles and guidelines. Includes an introduction to clinic policies and procedures. Prerequisite: Enrollment in the Psychology graduate program. (Typically offered: Spring)

PSYC 5080. Observational Practicum. 0 Hours.

Observation of senior therapists in the provision of psychodiagnostic and psychotherapeutic techniques. Pre- or Corequisite: Doctoral students only. (Typically offered: Fall, Spring and Summer) May be repeated for up to 0 hours of degree credit.

PSYC 5113. Theories of Learning. 3 Hours.

Major concepts in each of the important theories of learning. (Typically offered: Fall)

PSYC 5123. Cognitive Psychology. 3 Hours.

Contemporary theories and research on human information processing including topics such as memory, language, thinking, and problem solving. (Typically offered: Spring Even Years)

PSYC 5133. Inferential Statistics for Psychology. 3 Hours.

Inferential statistics, including representative parametric tests of significance. Special emphasis on analysis of variance, covariance, and component variance estimators as applied to psychological research. Prerequisite: PSYC 2013. (Typically offered: Fall)

PSYC 5143. Advanced Descriptive Statistics for Psychology. 3 Hours.

Special correlation techniques followed by a survey of representative nonparametric tests of significance. Major emphasis on advanced analysis of variance theory and designs. Prerequisite: PSYC 5133. (Typically offered: Spring)

PSYC 5153. Advanced History and Systems of Psychology. 3 Hours.

Advanced examination of the concepts, methods, and systems which have contributed to the development of modern psychology. (Typically offered: Fall)

PSYC 5163. Personality: Theory & Assessment. 3 Hours.

An introduction to empirically based theories of personality and personality disorders with an emphasis on standardized instruments in the assessment of normative and pathological personality. Includes training in the interpretation, integration, and reporting of results. Pre- or Corequisite: PSYC 5043. Prerequisite: Enrollment in the Psychology graduate program or instructor consent. (Typically offered: Spring)

PSYC 5173. Structural Equation Modeling. 3 Hours.

Introduction to concepts and methods of structural equation modeling. Major emphasis on advanced techniques to model latent variables using large sample survey data. Prerequisite: PSYC 5133 and PSYC 5143. Corequisite: Lab component. (Typically offered: Spring Even Years)

PSYC 5223. Perception. 3 Hours.

(Formerly PSYC 4123.) Theories and representative research in the areas of sensation and perception. Graduate degree credit will not be given for both PSYC 4123 and PSYC 5223. Prerequisite: Six hours of psychology, not including PSYC 2013. (Typically offered: Irregular)

PSYC 523V. Research Practicum. 1-3 Hour.

Presentation, evaluation, and discussion of on-going research proposals. Required of all experimental graduate students in the first 2 years of their program. (Typically offered: Fall and Spring)

PSYC 5313. Introduction to Clinical Science: Research Design and Ethical Guidelines. 3 Hours.

Provides a) guidelines for designing and conducting empirical research in clinical psychology, b) ethical principles that regulate clinical research, and c) supervised opportunities to develop a clinical research proposal. Prerequisite: Enrollment in the Psychology graduate program. (Typically offered: Fall)

PSYC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 602V. Seminar: Teaching Psychology. 1-3 Hour.

Survey of the literature on teaching of psychology in college. Includes: planning the course, method, examining and advising students. Prerequisite: Teaching assistant. (Typically offered: Fall and Spring)

PSYC 607V. Clinical Practicum III. 1-3 Hour.

Provides supervised experience in the application of the more complex and lesser known psychodiagnostic techniques and training and experience in psychotherapeutic techniques with the more severe functional disorders, with special topics in these domains emphasized across sections. Prerequisite: PSYC 5073; Enrollment in the Psychology graduate program. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 609V. Clinical Graduate Seminar. 1-3 Hour.

Provides intensive coverage of specialized clinical topics. Open to all graduate students. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

PSYC 611V. Individual Research. 1-18 Hour.

Individual research. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

PSYC 6133. Advanced Behavioral Neuroscience. 3 Hours.

Examination of the biological basis of behavior, with emphasis on underlying neural mechanisms. (Typically offered: Fall)

PSYC 6163. Psychotherapy. 3 Hours.

A conceptual overview of psychotherapy, with emphasis on a) common mechanisms, and b) cognitive, affective, and interpersonal approaches. Prerequisite: PSYC 5033. (Typically offered: Fall)

PSYC 6213. Psychotherapy Outcomes. 3 Hours.

Provides a critical evaluation of theory and research on empirically supported programs and interventions for major psychological disorders. Prerequisite: Enrollment in the Psychology graduate program. (Typically offered: Spring)

PSYC 6323. Seminar in Developmental Psychology. 3 Hours.

Discussion of selected topics in the area of human development. Emphasis will be on a review of current theory and empirical research. Topics selected for discussion could range from early development (child psychology), to later development (psychology of adulthood and aging-gerontology), to current attempts to integrate the field (life-span developmental psychology). (Typically offered: Fall Odd Years)

PSYC 6343. Seminar in Quantitative Methods. 3 Hours.

Discussion of selected mathematical approaches to theorizing and research in psychology. Emphasis will be on generalization of a given approach across several content areas of psychology. Hence, while each area must be treated in reasonable depth, current thinking and research spanning more than one content area will be stressed. (Typically offered: Irregular)

PSYC 6353. Seminar in Learning/Memory/Cognition. 3 Hours.

Discussion of selected topics in learning, memory, or cognition. Emphasis on current theory and empirical research. Topics selected for discussion may be in the areas of learning, memory, problem solving, or language. (Typically offered: Spring Odd Years)

PSYC 6373. Seminar in Personality and Social Psychology. 3 Hours.

Discussion of selected topics in social psychology and personality. Current theoretical positions and recent research findings are emphasized. Topics selected for discussion will be in areas of intrapersonal processes, interpersonal processes, group processes or any of various areas of personality. (Typically offered: Fall)

PSYC 6413. Seminar in Physiological Psychology. 3 Hours.

Discussion of selected topics in physiological psychology. Emphasis will be on a review of current theory and empirical research. Each offering of the seminar will examine the biological basis of a specific aspect of behavior, utilizing both animal and human data. (Typically offered: Spring Odd Years)

PSYC 698V. Field Work. 1-3 Hour.

Provides academic credit for field work in multidisciplinary setting, involving supervised experiences in assessment and psychotherapy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 699V. Clinical Psychology Internship. 1-3 Hour.

Supervised experience in a multidisciplinary setting of assessment and psychotherapy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PSYC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Public Administration (PADM) Courses

PADM 5803. Quantitative Methods Analysis. 3 Hours.

Data analysis techniques, including descriptive and inferential statistics and packaged computer programs. Prerequisite: Graduate standing. (Typically offered: Fall)

PADM 5813. Managing Information Technologies in Public Affairs. 3 Hours.

Examines digital interactions between citizens, institutions, and political interests from the perspective of analysts, civic leaders, and professional non-technical administrators. Explores timely issues related to public information transactions, ethics and best practices of public information management, and the strategic positioning of public information assets. Prerequisite: Graduate standing. (Typically offered: Spring)

PADM 5823. Grant Writing for the Social Sciences. 3 Hours.

This course will teach students the fundamentals of obtaining grants from local, state and federal agencies. (Typically offered: Irregular)

PADM 5833. Urban Planning. 3 Hours.

Reviews the many forms, functions, and purposes of American cities. Covers basic planning theories, surveys the various sub-fields of planning, discusses trends in the planning field, and utilizes computer simulations. (Typically offered: Fall)

This course is cross-listed with PLSC 4103.

PADM 5853. Performance Measurement in the Public and Nonprofit Sectors. 3 Hours.

Provides a hands-on approach for measuring organizational performance and using performance information of decision making. Addresses components and key issues of performance measurement, such as steps in the measurement process, methods of data gathering, and analysis. Prerequisite: PLSC 5193. (Typically offered: Summer)

PADM 5863. Issues in Public and Nonprofit Management. 3 Hours.

Explores current developments and themes in the theory and practice of public and nonprofit management. Covers a range of contemporary issues in the field, such as managing collaborative networks, e-government, and managing for results. Emerging trends are intensively discussed at the juncture of theory and practice. (Typically offered: Spring)

PADM 587V. Professional Development. 1-6 Hour.

Encompasses internships, professional projects if individual is employed full-time and not eligible for an internship, conference and workshop participation, and other activities conducive to the students development as a public service professional. (Typically offered: Fall, Spring and Summer)

PADM 588V. Directed Readings. 1-3 Hour.

Directed readings. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

PADM 589V. Independent Research. 1-3 Hour.

Independent Research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

PADM 5903. Risk and Public Policy. 3 Hours.

Examines how concepts of risk serve to justify and shape public policies and risk management practices. (Typically offered: Spring)

PADM 5913. Policy Analysis: Theory and Practice. 3 Hours.

Provides a firm theoretical foundation in, and an ability to apply, the general instruments necessary for professional practice of policy analysis. (Typically offered: Fall)

Public Health (PBHL) Courses

PBHL 5023. Teaching in Community Health Promotion. 3 Hours.

Examination and practical exposure to the principles and practices of undergraduate teaching in public health. Includes course planning, teaching techniques, assessment strategies, and supervised practice. Prerequisite: Admission to the M.S. or Ph.D. program in Community Health Promotion. (Typically offered: Fall and Spring) May be repeated for up to 3 hours of degree credit.

PBHL 5213. Evaluation of Public Health Programs. 3 Hours.

This seminar style course is designed to provide students with exposure to different types of program evaluation, including needs assessment, formative evaluation, process evaluation, and outcome and impact evaluation. The course covers theoretical frameworks supporting evaluation, ethics in evaluation, methods for data collection, reporting evaluation findings, and strengths and limitations of conducting program evaluation. Prerequisite: PBHL 5563 and HHPR 5353. (Typically offered: Fall)

PBHL 5353. Health Counseling. 3 Hours.

A review of the role and function of the health counselor including a focus on problem solving approaches for coping with daily problems of living, decision making, and life style planning. (Typically offered: Fall Odd Years)

PBHL 5533. Theories of Social and Behavioral Determinants of Health. 3 Hours.

This course will provide a basic foundation in the social and behavioral sciences relevant to public health. Students will learn the role of social and behavioral determinants in the health of individuals and of populations. Then, students will learn models and theories of health behavior, both generally and specifically. Generally, the student will learn how to identify, analyze, and use theoretical constructs and principles with particular attention to the use of theory in professional public health practice. Specifically, the student will learn the constructs and principles of several theories commonly used in public health behavior research and intervention design. The course will cover the four major individual that focus on intrapersonal factors (i.e., Health Belief Model, Transtheoretical Model, Theory of Reasoned Action/Planned Behavior, and Social Cognitive Theory) as well as several social, organizational, and community theories that are beyond the individual level. (Typically offered: Fall)

PBHL 5543. Contemporary Issues in Human Sexuality. 3 Hours.

Indepth analysis of the social, biological, and behavioral factors associated with the development of one's sexuality. (Typically offered: Irregular)

PBHL 5563. Public Health: Practices and Planning. 3 Hours.

Acquaints the student with the structure, functions, and current problems in public health and with the role of education in public health. Prevention and control practices and planning will be emphasized. Prerequisite: PBHL 5573. (Typically offered: Spring)

PBHL 5573. Principles of Health Education. 3 Hours.

Current trends, basic issues, controversial issues, and fundamental principles of health education. (Typically offered: Fall)

PBHL 5613. Epidemiology. 3 Hours.

This course will present principles and practices related to the prevention and control of health-related conditions in the human population. Emphasis will be placed on understanding the concepts of epidemiology, including aspects of disease distribution, epidemiologic methods, risk of disease and injury, descriptive and analytic epidemiologic methods and study designs, and application of epidemiologic data to the prevention and control of disease. Format will include lecture and small group seminars. (Typically offered: Fall)

PBHL 5623. Human Diseases. 3 Hours.

(Formerly PBHL 4623.) An examination of the variety, behavior, distribution, and management of both infectious and noninfectious diseases in human populations. Graduate degree credit will not be given for both PBHL 4623 and PBHL 5623. (Typically offered: Irregular)

PBHL 5633. Health Services Administration. 3 Hours.

Emphasis is on an examination of administrative factors related to health services. Administrative and professional authority, boards, consumers, delivery of services, federal role, and cost containment will also be addressed. (Typically offered: Irregular)

PBHL 5643. Multicultural Health. 3 Hours.

Through lecture, discussion, simulations, and case studies, students will develop an appreciation for the cultural traditions and practices of different groups. The importance and implications of these traditions on health outcomes and health status will be examined. Particular attention will be paid to the role of the public health educator in mediating the impact of health disparities, including advocacy. Students will develop skills of cultural competence that are essential for public health practitioners today. Prerequisite: Graduate standing or consent. (Typically offered: Spring Even Years)

PBHL 574V. Internship. 1-6 Hour.

Internship in health behavior and health promotion. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

PBHL 589V. Independent Research. 1-6 Hour.

Development, implementation, and completion of graduate research project.
Prerequisite: M.S. degree in Community Health Promotion and HHPR 5353 and ESRM 5393. (Typically offered: Fall, Spring and Summer)

PBHL 600V. Master's Thesis. 1-6 Hour.

Thesis in health behavior and health promotion. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

PBHL 6013. Advanced Directed Research. 3 Hours.

This course is intended for doctoral students who wish to pursue research under the direction of a faculty member. In this course, doctoral students will work independently and collaborate with faculty member(s) and fellow students to conduct research in a specified area of interest. The purpose of the course is for the student to develop knowledge in her/his own domain, strengthen her/his research skills, and work collaboratively on research projects. The course will aim for students to present research findings at conferences and/or publish research findings in peer reviewed journals. The directed research course places more emphasis on the students' role as a researcher in an academic setting. Prerequisite: Admission to the Ph.D. program in Community Health Promotion. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

PBHL 605V. Independent Study. 1-6 Hour.

Provides students with an opportunity to pursue special study of education problems. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PBHL 6333. Health Behavior Research. 3 Hours.

A review of human behavior and its relationship to health and wellbeing. Focuses on contemporary health behavior research and instrumentation. (Typically offered: Fall Even Years)

PBHL 6553. Environmental Health. 3 Hours.

An analysis and evaluation of the various environmental factors that influence our health. Causes of problem factors are identified and solutions proposed for improving environmental conditions. (Typically offered: Spring)

PBHL 6733. Health and the Aging Process. 3 Hours.

An overview of the health-related issues facing elderly populations with in-depth study of the biological and behavioral changes associated with aging. (Typically offered: Irregular)

PBHL 6803. Health Communication Theory, Research and Practice. 3 Hours.

This course is designed to acquaint you with the role of communication in health education and with basic principles and practices in interpersonal, group, and mass communication. Health communication theory will be discussed in the first part of the semester, followed by important research in the area of health communication, and finally putting to practice the material will be the terminal experience for the course. (Typically offered: Spring Odd Years)

PBHL 6833. Principles of Epidemiology II. 3 Hours.

Provides students with knowledge and skills necessary to design, conduct, and interpret observational epidemiological concepts, sources of data, prospective cohort studies, retrospective cohort studies, case-control studies, cross-sectional studies, methods of sampling, estimating sample size, questionnaire design, and effects of measurement error. Corequisite: ESRM 5393 or ESRM 6403. (Typically offered: Spring and Summer)

PBHL 699V. Seminar. 1-6 Hour.

Discussion of selected topics and review of current literature in community health promotion. Prerequisite: Advanced graduate standing. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

Public Policy (PUBP) Courses

PUBP 6001. Pro-Seminar. 1 Hour.

An introduction to the field of public policy and to the program. The seminar will address topics such as the meaning of public policy, policy research, the dissertation process, and particular issues of public policy concern. Prerequisite: Admission to program. (Typically offered: Fall)

PUBP 6013. Theories of Public Policy. 3 Hours.

This seminar introduces doctoral students to the major concepts, frameworks, and theories of public policy. Emphasis is on the usefulness and limitations of these frameworks and theories in empirical research. Prerequisite: Graduate standing. (Typically offered: Fall)

PUBP 6023. Law and Public Policy. 3 Hours.

This course focuses on the legal aspects of public policy, with emphasis on the regulatory process and its legal constraints. Also considered are the process of administrative decision making, judicial review, legislative oversight, and public access to government information. (Typically offered: Spring)

PUBP 6033. Community Development Policy and Practice. 3 Hours.

This course examines multiple community development definitions, the community capitals framework as well as theories, conceptual frameworks and processes and how these are linked, both historically and currently, to broad-based US public policy and specifically, housing and workforce development policies. (Typically offered: Summer)

PUBP 604V. Special Topics in Public Policy. 1-6 Hour.

Designed to cover specialized topics not usually presented in depth in regular courses. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

PUBP 6103. Policy Planning, Implementation, and Evaluation. 3 Hours.

This interdisciplinary seminar will explore the relationship between policy, public administration, and organizations in the community. Stakeholder groups will be considered as part of the newer approaches to practice-driven scholarship. The class will examine innovative approaches to decision making, strategic management and policy leadership in complex interorganizational and interagency settings. (Typically offered: Irregular)

PUBP 6113. Agenda Setting and Policy Formulation. 3 Hours.

Introduces agenda and policy formation focusing on the classic theoretical and empirical literature. The course is designed to introduce graduate students to a variety of theories typologies, concepts, and ideas relating to the study of public policy. (Typically offered: Fall)

PUBP 612V. Research Problems in Policy. 1-6 Hour.

Research problems. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

PUBP 6134. Capstone Seminar in Public Policy. 4 Hours.

This course is intended to integrate various policy interests in a specific community based project. Prerequisite: Instructor permission required. (Typically offered: Fall and Spring)

PUBP 6143. Mixed Method Research Design. 3 Hours.

Mixed method research is a multi-point research strategy that combines quantitative and qualitative research strategies into a single research project. (Typically offered: Irregular)

PUBP 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. Prerequisite: Candidacy. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Recreation and Sport Management (RESM) Courses

RESM 5023. Outdoor Adventure Leadership. 3 Hours.

(Formerly RESM 4023.) This course considers the values and scope of outdoor recreation programs, leadership and skill development with practical experience in a wilderness environment. The course will include a canoe trip through the wilderness, and skill training in such areas as orienteering and rock climbing; and leadership development in interpersonal and processing skills. The graduate portion of the class is geared toward leading and trip planning for taking college age and older students into remote areas. Graduate degree credit will not be given for both RESM 4023 and RESM 5023. (Typically offered: Summer)

RESM 5273. The Intramural Sports Program. 3 Hours.

(Formerly RESM 4273.) Historical development, aim and objectives, organization, administration, units of competition, program of activities, schedule making, scoring plans, rules and regulations, awards, and special administrative problems. Graduate degree credit will not be given for both RESM 4273 and RESM 5273. (Typically offered: Fall Odd Years)

RESM 5283. History and Application of American Sport. 3 Hours.

This survey course will explore the historical development of sport in American culture and the processes of change in American culture and sport from the 15th century to the present. Students will learn how to apply historical concepts to current issues in recreation and sport management. (Typically offered: Irregular)

RESM 5293. Athletics and Higher Education. 3 Hours.

This course features an examination of the historical development of athletics within American institutions of higher learning with an emphasis upon concepts and ideals that underlie the developments and the major problems affecting contemporary intercollegiate athletics. The purpose of this course is to teach the learner about the development of intercollegiate athletics from the mid-19th century to today. A second purpose of this course is to examine the major issues facing sport administrators within intercollegiate athletics today. (Typically offered: Spring and Summer)

RESM 5333. Sport Media and Public Relations. 3 Hours.

The course will explore the relationship between media organizations and sport organizations, with an emphasis on the business of media rights, as well as public relations theories such as two-way symmetrical communication and agenda setting. Finally, the course will examine practical communication tactics employed by public relations practitioners such as image repair and crisis communications, and the issues presented by forms of new media. (Typically offered: Fall)

RESM 5463. Sports Facilities Management. 3 Hours.

Considers basic elements and procedures in the planning, design, construction, operation, and maintenance of sport facilities; management considerations in conducting various types of events. (Typically offered: Summer)

RESM 560V. Workshop. 1-3 Hour.

Workshop. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

RESM 574V. Internship. 1-3 Hour.

This experiential-based course requires 135 hours per semester of work in a recreation or sport setting. (Typically offered: Fall, Spring and Summer)

RESM 5813. Social Issues in Sport. 3 Hours.

Using sociological theories and scholarship to examine social and cultural influences on sport and physical activity. Course is based on a social justice framework and a cultural studies perspective. (Typically offered: Fall and Summer)

RESM 5833. Recreation and Sport for Special Populations. 3 Hours.

Skills, knowledge, and concepts within recreation and sport which are appropriate to planning and implementing recreation and sport programs and services for the handicapped. (Typically offered: Irregular)

RESM 5843. Tourism. 3 Hours.

Explores major concepts of tourism to discover what makes tourism work, how tourism is organized, and its social and economic effects. (Typically offered: Spring)

RESM 5853. Capstone in Recreation and Sport Management. 3 Hours.

Capstone course where students utilize program courses to solve administrative issues which may arise in an organization. Attention is given to how departmental organization, administrative practices and policies, strategic planning, personnel management, finances, and legal areas are integrated to create solutions to broad-based contemporary issues. (Typically offered: Spring)

RESM 5873. Leadership in Recreation and Sport Management Services. 3 Hours.

Considers research, theory, and practical applications of leadership principles utilized in the provision of recreation and sport management services. Focus is on motivation, attitude, communication, group dynamics, and problem solving. (Typically offered: Fall and Summer)

RESM 5883. Recreation and Sport Services Promotion. 3 Hours.

Examines specific strategies for promoting recreation and sport programs in the local community. (Typically offered: Summer)

RESM 5893. Public and Private Finance in Recreation and Sport Management. 3 Hours.

Develops an understanding of both public and private finance management for students in public and private management positions. Provides an understanding of the budgeting processes and techniques used in obtaining and controlling funds, including private sector finance problems in areas of credit, pricing, indexing, and debt management. (Typically offered: Fall)

RESM 600V. Master's Thesis. 1-18 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

RESM 605V. Independent Study. 1-3 Hour.

Independent study. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

RESM 612V. Directed Reading in Recreation and Sport. 1-3 Hour.

Critical analysis of literature in the area of recreation and sport. (Typically offered: Fall, Spring and Summer)

RESM 6133. Issues in RESM. 3 Hours.

A review of the significant social, demographic, behavioral, developmental, and technological issues that influence health, kinesiology, and recreation and sport management programs. Pre- or Corequisite: Doctoral level students only. (Typically offered: Irregular)

RESM 6533. Legal and Political Aspects. 3 Hours.

An overview of major legislation affecting recreation and sport management professions; how to operate within these laws; and methods for influencing new legislation. Also discusses political aspects of professions both outside and inside government agencies. (Typically offered: Spring)

RESM 674V. Internship. 1-3 Hour.

Students will learn diverse teaching techniques and implement them in an ongoing undergraduate recreation and sport management class serving as the teaching laboratory. The 'what' 'when' and 'how' relative to integrating various teaching techniques with specific content areas in the class will be explored by both the student and the instructor. (Typically offered: Fall, Spring and Summer)

Rural Sociology (RSOC) Courses

RSOC 5603. Community and Natural Resources. 3 Hours.

Introduction to the breadth of considerations involved in community resource management, including theoretical frameworks, methodological investigations and applied practices to enhance the ability of community development professionals to work with their communities to plan, develop and monitor the conservation and development of natural resources with multiple functions. (Typically offered: Irregular)

RSOC 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

RSOC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Russian (RUSS) Courses

RUSS 5113. Special Themes in Russian. 3 Hours.

Covers topics not normally dealt with in period courses. Sample topics include gender and sexuality, war and memory, Holocaust, art and protest, modernism/post-modernism, Jewish writers, and cinema. Topics announced one semester in advance. This course is taught in English. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

RUSS 5123. Survey of Russian Literature from Its Beginning to the 1917 Revolution. 3 Hours.

(Formerly RUSS 4123.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English. Graduate degree credit will not be given for both RUSS 4123 and RUSS 5123. (Typically offered: Irregular)

RUSS 5133. Survey of Russian Literature Since the 1917 Revolution. 3 Hours.

(Formerly RUSS 4133.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English with readings in English. Graduate degree credit will not be given for both RUSS 4133 and RUSS 5133. (Typically offered: Irregular)
This course is cross-listed with WLIT 5133.

RUSS 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Fall and Spring) May be repeated for degree credit.

Social Work (SCWK) Courses

SCWK 5003. Foundations of Culturally Competent Social Work Practice. 3 Hours.

The purpose of this course is the acquisition and demonstration of beginning graduate-level social work values and ethics, knowledge, and skills necessary for cultural competence in work with individuals, families, groups, organizations, communities, and global contexts. A multi-systems life-course conceptual framework is used. Prerequisite: Admission to the two-year or part-time MSW program. (Typically offered: Fall)

SCWK 5013. Bridge Course: Evidenced Based Social Work. 3 Hours.

This course prepares MSW students to transition from the foundation course to the advanced concentration courses. Students will become familiar with the mission and conceptual framework underlying the advanced concentration and develop beginning knowledge of traditional and alternative approaches to client system assessment. Prerequisite: Admission into the advanced standing MSW program or completion of foundation courses. (Typically offered: Summer)

SCWK 505V. Special Topics in Social Work. 1-6 Hour.

(Formerly SCWK 405V.) Comprehensive study of various topics of importance in contemporary social welfare and social work practice. Graduate degree credit will not be given for both SCWK 405V and SCWK 505V. (Typically offered: Irregular) May be repeated for degree credit.

SCWK 5073. Social Work Research and Technology II. 3 Hours.

This course is intended to build the advanced research skills necessary to develop a research proposal and complete a thesis or capstone project. Students will plan the project, collect and analyze data and write a research report of their findings. Projects will focus on systematic evaluation of service delivery and personal professional practice. Prerequisite: Completion of year one for two-year students or summer semester for advanced standing students. (Typically offered: Fall)

SCWK 5083. Social Work With Elders. 3 Hours.

(Formerly SCWK 4183.) Survey of theories of gerontology, service programs and unmet needs of the aging citizen. Graduate degree credit will not be given for both SCWK 4183 and SCWK 5083. (Typically offered: Irregular)

SCWK 5093. Human Behavior and the Social Environment I. 3 Hours.

(Formerly SCWK 4093.) Provides a conceptual framework for knowledge of human behavior and the social environment with a focus on individuals. Social systems, life-course, assets, and resiliency-based approaches are presented. Special attention is given to the impact of discrimination and oppression on the ability to reach or maintain optimal health and well-being. Graduate degree credit will not be given for both SCWK 4093 and SCWK 5093. Prerequisite: COMM 1313, PSYC 2003, SOCI 2013, SCWK 2133, and SCWK 3193 and (BIOL 1543 and BIOL 1541L, or ANTH 1013 and ANTH 1011L). (Typically offered: Fall and Spring)

SCWK 5103. Human Behavior and the Social Environment II. 3 Hours.

(Formerly SCWK 4103.) This course applies the basic framework for creating and organizing knowledge of human behavior and the social environment acquired in HBSE I to the understanding of family, group, organizational, community, and global systems. Attention is given to discrimination, oppression, the impact of technology, and poverty at each system level. Graduate degree credit will not be given for both SCWK 4103 and SCWK 5103. Prerequisite: SCWK 4093 or SCWK 5093 (formerly SCWK 4093) and SCWK 4153 or SCWK 5353 (formerly SCWK 4153). (Typically offered: Fall and Spring)

SCWK 5143. Global Social and Economic Justice and Oppression. 3 Hours.

The role and responsibilities of the social work profession are examined in an international comparative context. Particular emphasis is given to social workers' responsibilities to advance global social and economic justice and reduce human oppression through community, social, economic, and organizational development strategies. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5163. Social Work Management, Administration and Supervision. 3 Hours.

This course develops advanced skills in management, administration, and supervision in social work organizations. Emphasis is placed on developing leadership skills in ethics, budgeting, finance, resource development, information management, evaluation, staff hiring, supervision and development, and the use of technology in organizational leadership, development, and maintenance. Prerequisite: Graduate standing and SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5173. Advanced Practice with Families and Couples. 3 Hours.

The purpose of this course is to provide advanced understanding of the knowledge, skills and values needed to assess and intervene effectively with traditional and non-traditional families and couples. The course will examine social systems and life-course strengths approaches to understand how families and couples function. Students will design interventions. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5183. Advanced Practice with Individuals. 3 Hours.

This course develops advanced skills in social work practice on a micro level. Students learn to analyze and compare practice models. They gain skills in selecting a practice model and integrating multiple models based on client needs. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5213. Advanced Practice in Behavioral and Mental Health. 3 Hours.

This advanced course prepares students to identify mental disorders, plan intervention strategies with clients from a strengths perspective, and understand mental health programs through which services are delivered. Differential diagnosis and the impact of socioeconomic status, gender, race, and sexual orientation on diagnosis and treatment decisions are addressed. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5243. The Diagnosis and Treatment of Substance Use Disorders. 3 Hours.

The Diagnosis and Treatment of Substance Use Disorders course will explore the use and abuse of drugs and alcohol with an emphasis on evidence-based treatment approaches to help engage and treat chemically dependent clients. Best practices to be reviewed will include Motivational Interviewing (MI), Cognitive Behavioral Therapy (CBT), harm reduction approaches, Medication Assisted Treatment (MAT), and Dialectical Behavioral Therapy (DBT). (Typically offered: Fall, Spring and Summer)

SCWK 5253. Spirituality and Social Work Practice. 3 Hours.

This course prepares students to respond competently and ethically to diverse spiritual and religious perspectives. Utilizing social work ethics and values as a guide, students will develop a comparative, critically reflective approach to practice. Prerequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103) or SCWK 5003 or SCWK 5013. (Typically offered: Fall and Spring)

SCWK 5263. Drug Policy and Its Impact on Approaches to Substance Use Disorder Treatment. 3 Hours.

The Drug Policy course will explore the history of drug policy within the United States, focusing on the relationship between people, drugs, and the criminalization of certain substances. This course will also examine how the War on Drugs has led to the collateral consequences of mass incarceration, racial discrimination in policy development and sentencing laws, and a treatment system that exists almost exclusively within the criminal justice system. Finally, this course will explore how other countries have developed and utilized harm reduction and decriminalization approaches and policies in order to shift treatment and financial resources from supply and enforcement to demand and treatment. (Typically offered: Fall, Spring and Summer)

SCWK 5273. Social Work Research and Technology I. 3 Hours.

(Formerly SCWK 4073.) An overview of forms and sources of social work research including existing social data, techniques for collecting original social data, and techniques of organization, interpretation, and presentation of data. Students will also become proficient in the use of current technology for social work research and practice. Graduate degree credit will not be given for both SCWK 4073 and SCWK 5273. Prerequisite: SCWK 4093 or SCWK 5093 (formerly SCWK 4093) and SCWK 4153 or SCWK 5353 (formerly SCWK 4153). Pre- or Corequisite: One of the following: STAT 2303, SOCI 3303 and SOCI 3301L, PSYC 2013, or ESRM 2403. (Typically offered: Fall and Spring)

SCWK 5333. Social Work Practice I. 3 Hours.

(Formerly SCWK 4333.) This is the first in the sequence of practice courses introducing students to the generalist approach to micro social work. This course focuses on developing a solid foundation for practice with individuals, including learning basic communication and helping skills, values, principles, and the connection of theory to practice. Graduate degree credit will not be given for both SCWK 4333 and SCWK 5333. Prerequisite: SCWK 4093 or SCWK 5093 (formerly SCWK 4093) and SCWK 4153 or SCWK 5353 (formerly SCWK 4153). Pre- or Corequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103). (Typically offered: Fall and Spring)

SCWK 5343. Advanced Practice with Groups. 3 Hours.

This course provides advanced knowledge, skills, and values needed to assess and intervene effectively with populations seen in the social work practice of group therapy. This course examines group dynamics, life-course and strengths perspectives, and client-centered assessment of needs and their application in agency settings. Prerequisite: SCWK 5003 or SCWK 5013. (Typically offered: Irregular)

SCWK 5353. Social Welfare Policy. 3 Hours.

(Formerly SCWK 4153.) Describes and analyzes the policies and services rendered by local, state, regional, national, and international agencies as well as the policy implications for social work practice. Students prepare to advocate social policy changes designed to improve social conditions, promote social and economic justice, and to empower at-risk populations. Graduate degree credit will not be given for both SCWK 4153 and SCWK 5353. Prerequisite: COMM 1313, PLSC 2003, SCWK 2133, and SCWK 3193. (Typically offered: Fall and Spring)

SCWK 5412. Foundation Field Seminar. 2 Hours.

A required course for MSW students without an accredited undergraduate degree in social work. The purpose of the seminar is to allow students to integrate classroom content with experiences in the field, to learn peer supervision and consultation, and to learn from the experiences of other students in the field. Corequisite: SCWK 5434. (Typically offered: Spring and Summer)

SCWK 5434. Foundation Field Internship. 4 Hours.

This course is required of all graduate students entering the MSW program without an accredited undergraduate degree in social work. Minimum of 330 clock hours of agency-based professional social work practicum experience, supervised by a licensed MSW, is required. Corequisite: SCWK 5412. Prerequisite: SCWK 5003, SCWK 5333 (formerly SCWK 4333), SCWK 5273 (formerly SCWK 4073), SCWK 5093 (formerly SCWK 4093), and SCWK 5353 (formerly SCWK 4153). (Typically offered: Spring and Summer)

SCWK 5442. Field Seminar III. 2 Hours.

This seminar is required of all graduate students entering the MSW program with advanced standing. Students integrate classroom content with experiences in the field, learn peer supervision and consultation, and learn from the experience of other students in the field. Corequisite: SCWK 5444. Prerequisite: Admission to graduate program with advanced standing. (Typically offered: Summer)

SCWK 5444. Field Internship III. 4 Hours.

This course is required of all graduate students entering the MSW program with advanced standing. A minimum of 240 clock hours of agency-based professional social work practicum experience, supervised by a licensed MSW, is required. Corequisite: SCWK 5442. Prerequisite: Admission to graduate program with advanced standing. (Typically offered: Summer)

SCWK 5543. Social Work Practice II. 3 Hours.

(Formerly SCWK 4343.) This is the second course in the social work practice sequence, emphasizing theories, models, and techniques related to generalist practice with families and groups. The course elaborates on system theory as it impacts groups and families, and use of experiential teaching methods. Graduate degree credit will not be given for both SCWK 4343 and SCWK 5543. Prerequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103) and SCWK 4333 or SCWK 5333 (formerly SCWK 4333). (Typically offered: Fall and Spring)

SCWK 5733. Social Work Practice III. 3 Hours.

(Formerly SCWK 4733.) Students acquire and practice the skills, knowledge, and values necessary for culturally competent generalist social work practice with organizations and communities. Special attention is given to the implications of discrimination and oppression for attaining social and economic justice. Graduate degree credit will not be given for both SCWK 4733 and SCWK 5733. Prerequisite: SCWK 4333 or SCWK 5333 (formerly SCWK 4333). Pre- or Corequisite: SCWK 4103 or SCWK 5103 (formerly SCWK 4103) and SCWK 4343 or SCWK 5543 (formerly SCWK 4343). (Typically offered: Fall and Spring)

SCWK 596V. Independent Study. 1-6 Hour.

Independent study designed to meet the particular needs of individual graduate students. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SCWK 6000L. Thesis Laboratory. 0 Hours.

This laboratory is required for completion of the thesis, which is developed through components of the graduate Research & Technology sequence. Other courses in the graduate curriculum provide support for the conceptualization and development of the thesis. (Typically offered: Fall and Spring)

SCWK 6003. Advanced Social Work Practice Using the MSLC Perspective. 3 Hours.

Advanced Social Work Practice Using the Multi-Systems Life Course (MSLC) perspective teaches advanced practice behaviors with individuals, families, groups, organizations, and communities. This course focuses on integrating the arenas of advanced theory, research, policy practice, direct practice, required competencies and advanced practice behaviors using the MSLC perspective. Prerequisite: Admission into the advanced standing MSW program or completion of foundation courses. (Typically offered: Fall)

SCWK 6233. Advanced Social Work Practice With Children And Youth Using the MSLC Perspective. 3 Hours.

This course focuses on the development, revision, and impact of practice with children and youth from a Multi-Systems Life Course (MSLC) perspective. Historical trends as well as current practices will be examined with a focus on learning and improving social work practice skills. Prerequisite: SCWK 6003. (Typically offered: Spring)

SCWK 6243. Advanced Social Work Practice With Adults Using the MSLC Perspective. 3 Hours.

This course focuses on the development, revision, and impact of practice with adults from a Multi-Systems Life Course (MSLC) perspective. Historical trends as well as current practices will be examined with a focus on learning and improving social work practice skills. Prerequisite: SCWK 6003. (Typically offered: Spring)

SCWK 6442. Advanced Field Seminar I. 2 Hours.

The first of two advanced field seminars required of all students in the MSW program. The purpose of the seminar is to allow students to integrate classroom content with experiences in the field, to practice peer supervision and consultation, and to learn from the experiences of other students in the field. Corequisite: SCWK 6444. Prerequisite: SCWK 5412 or SCWK 5442. (Typically offered: Fall)

SCWK 6444. Advanced Field Internship I. 4 Hours.

This is the first of two advanced field internships required of all graduate students in the MSW program. A minimum of 330 clock hours of agency-based professional social work practicum experience, supervised by a licensed MSW, is required. Corequisite: SCWK 6442. Prerequisite: SCWK 5434 or SCWK 5444. (Typically offered: Fall)

SCWK 6452. Advanced Field Seminar II. 2 Hours.

This is the second of two advanced field seminars required of all students in the MSW program. The purpose of the seminar is to allow students to integrate classroom content with experiences in the field, to demonstrate peer supervision and consultation, and to learn from the experiences of other students in the field. Corequisite: SCWK 6454. Prerequisite: SCWK 6442. (Typically offered: Spring)

SCWK 6454. Advanced Field Internship II. 4 Hours.

This is the second of two advanced Field Internship courses required of all graduate students in the MSW program. A minimum of 330 clock hours of agency-based professional social work practicum experience supervised by a licensed MSW is required. Corequisite: SCWK 6452. Prerequisite: SCWK 6442. (Typically offered: Spring)

Sociology (SOCl) Courses

SOCI 5001. Proseminar. 1 Hour.

An informal forum for graduate students and faculty to present and discuss ongoing research interests as well as the current state of the discipline. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 500V. Advanced Problems in Sociology. 1-3 Hour.

Individual research on problems or problem areas. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

SOCI 5013. Advanced Social Research. 3 Hours.

An examination of experimental and quasi-experimental designs used in the analysis of sociological data with focus upon appropriate units of analysis and design selection, sampling, interview techniques, and questionnaire construction. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall)

SOCI 503V. Special Topics. 1-6 Hour.

Designed to cover specialized topics not usually presented in depth in regular courses. Prerequisite: Graduate Standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SOCI 5083. Applied Qualitative Research. 3 Hours.

An introduction to research strategies including intensive interviewing, participant observational fieldwork, content analysis, historical analysis, and comparative research. Emphasis on the practical aspects of designing and executive research involving multiple methods of data gathering and analysis. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 5113. Seminar in Social Inequality. 3 Hours.

Major theories of stratification; types of stratification systems, comparisons of modern and traditional systems; emergent trends. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5133. The Community. 3 Hours.

A sociological analysis of the theory, methods and materials used in the study of the community. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5233. Theories of Deviance. 3 Hours.

A survey of major theories-classical, developmental, ecological, functionalist, conflict, subcultural, control, and phenomenological-explaining morally condemned differences in society. Particular emphasis is on practical implications of each perspective for policy and social control. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5253. Classical Social Theory. 3 Hours.

A survey of social theory up to the late 20th century. An introduction to the classical sociological themes that continue to inform research, analysis, and policy formation. Major issues will include the relationship between the individual and the community, and the sources of stability, conflict, and change. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 5263. Contemporary Social Theory. 3 Hours.

Analysis of contemporary social theories & major theoretical debates. Emphasis is on critical evaluation & application of theoretical perspectives to current social issues affecting families and communities. Prerequisite: Graduate standing. (Typically offered: Spring)

SOCI 5311L. Applied Data Analysis Laboratory. 1 Hour.

Provides instruction for data transformations required for the advanced statistical procedures used in the Statistical Package for the Social Sciences (SPSS). Also provides instruction in the use of advanced statistical procedures covered in SOCI 5313. Prerequisite: Graduate standing. (Typically offered: Spring)

SOCI 5313. Applied Data Analysis. 3 Hours.

Covers basic concepts and applications of the general linear model to a variety of sociological research issues and problems. Also provides an introduction to binary dependent and multivariate categorical data analysis for sociological research. Prerequisite: Graduate standing. Familiarity with statistical computer programs is assumed. (Typically offered: Spring)

SOCI 5413. Seminar in Criminological Theory. 3 Hours.

An examination of the causation of crime, focusing primarily on sociological theories. Prerequisite: Graduate standing. (Typically offered: Spring)

SOCI 5423. Research in Criminology. 3 Hours.

Examination of empirical research in criminology, focusing on methodological problems, strategies, and findings. Prerequisite: Graduate standing. (Typically offered: Fall)

SOCI 5433. Victimization. 3 Hours.

Study of the causes, correlates, and consequences of victimization, focusing on theories of victimization and the role of victims in the criminal justice system. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5443. Seminar in Terrorism and Homeland Security. 3 Hours.

Examines the evolution of modern terrorism and homeland security, focusing primarily on the dynamics of American terrorist movements (ideologies, motives, and tactics). Social, political, and criminal justice responses to terrorism are also considered. (Typically offered: Spring)

SOCI 5453. Social Control. 3 Hours.

Study of sociological theories and research on formal social control, primarily institutional responses to criminal behavior. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5473. Crime and Community. 3 Hours.

Examination of how neighborhood structural characteristics and social organization affect crime, as well as how the presence of crime and disorder in a community can affect neighborhood social organization. Prerequisite: Graduate standing. (Typically offered: Irregular)

SOCI 5503. Research Internship. 3 Hours.

Supervised research experience. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

SOCI 5603. Environmental Sociology. 3 Hours.

(Formerly SOCI 4603.) The course provides a social perspective on environmental issues. It examines the linkage between society, ecological systems and the physical environment. It provides conceptual framework(s) for analyzing environmental issues, considers the role of humans in environmental issues, and enhances understanding the complexity of the relationship between societal organization and environmental change. Graduate degree credit will not be given for both SOCI 4603 and SOCI 5603. (Typically offered: Spring)

This course is cross-listed with HDFS 5603.

SOCI 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Space and Planetary Sciences (SPAC) Courses

SPAC 5033. Astrophysics I: Stars and Planetary Systems. 3 Hours.

Stellar structure and evolution, the properties of the solar system, and extrasolar planetary systems. (Typically offered: Fall Odd Years)
This course is cross-listed with ASTR 5033.

SPAC 5111L. Space and Planetary Lab. 1 Hour.

Laboratory course in space and planetary sciences consisting of experiments in the five major areas of space and planetary sciences: planetary astronomy, planetary geology, planetary atmospheres, origin and evolution of life and orbital mechanics and astronautics. Intended for students enrolled in the graduate programs in space and planetary sciences. (Typically offered: Fall)

SPAC 5123. Internship. 3 Hours.

Internship for graduate students in the space and planetary sciences graduate degree programs and concentrations in the graduate programs in physics, biology, geosciences and mechanical engineering. Students conduct a phase of their research, normally for one month, at a national or industrial laboratory in North America or overseas. (Typically offered: Fall and Spring)

SPAC 5161. Seminar. 1 Hour.

Seminars organized by the Center for Space and Planetary Sciences covering topics on the cutting edge of research in the field for graduate students conducting research with a faculty member in the space and planetary sciences as part of their graduate degree programs or concentrations in the graduate programs in physics, biology, geology, geography and mechanical engineering. (Typically offered: Fall and Spring)

SPAC 5211. SPAC Proseminar. 1 Hour.

Introductory course consisting of discourses and case studies in ethics, communications and public policy in the administration of space and planetary sciences. Prerequisite: Admission to program or instructor consent. (Typically offered: Spring)

SPAC 5313. Planetary Atmospheres. 3 Hours.

Origins of planetary atmospheres, structures of atmospheres, climate evolution, dynamics of atmospheres, levels in the atmosphere, the upper atmosphere, escape of atmospheres, and comparative planetology of atmospheres. (Typically offered: Irregular)

SPAC 5413. Planetary Geology. 3 Hours.

Exploration of the solar system, geology and stratigraphy, meteorite impacts, planetary surfaces, planetary crusts, basaltic volcanism, planetary interiors, chemical composition of the planets, origin and evolution of the Moon and planets. (Typically offered: Spring Even Years)

SPAC 5553. Astrobiology. 3 Hours.

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth, possibility of life elsewhere in the solar system (including Mars), and the possibility of life on planets around other stars. Prerequisite: Instructor consent. (Typically offered: Spring Even Years)
This course is cross-listed with BIOL 5553.

SPAC 5613. Astronautics. 3 Hours.

Study of spacecraft design and operations. Prerequisite: Admission to program or instructor consent. (Typically offered: Irregular)

SPAC 600V. Master's Thesis. 1-10 Hour.

Master's thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

SPAC 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Spanish (SPAN) Courses

SPAN 5073. Introduction to Hispanic Linguistics. 3 Hours.

Deepens students' knowledge of the Spanish language through an introduction to the discipline of Linguistics, which is the field of science that studies human language. Areas of Hispanic linguistics that will be covered include phonology (sound system), morphology (word structure), and syntax (sentence structure). (Typically offered: Irregular)

SPAN 5203. Medieval Spanish Literature. 3 Hours.

From the 'Jarchas' to the Celestina. (Typically offered: Irregular)

SPAN 5233. Golden Age Novel. 3 Hours.

Major works of Spanish prose fiction from the 16th and 17th centuries, with close reading of major works. (Typically offered: Irregular)

SPAN 5243. Golden Age Poetry and Drama. 3 Hours.

History and development of those genres in the 16th and 17th centuries, with close reading of major works. (Typically offered: Irregular)

SPAN 5253. Colonial Literature and Culture. 3 Hours.

An introductory course to the history, culture and literature of colonial Spanish America from 1492 until 1810. The course will cover representative colonial and indigenous texts and their contexts including Renaissance, Baroque, and travel literature of the Eighteenth Century. The course will be taught in Spanish. (Typically offered: Irregular)

SPAN 5273. Survey of 19th Century Spanish Literature. 3 Hours.

A graduate-level survey of Spanish literature from Neoclassicism to the Generation of 1898. (Typically offered: Irregular)

SPAN 5283. Survey of Contemporary Spanish Literature. 3 Hours.

A graduate-level survey of Spanish literature from the Transition to the present. (Typically offered: Irregular)

SPAN 5343. Survey of 20th Century Spanish Literature. 3 Hours.

A graduate-level survey of Spanish literature from the Generation of 1898 to the Transition. Prerequisite: Graduate standing. (Typically offered: Irregular)

SPAN 5393. 19th Century Spanish American Literature. 3 Hours.

Study of representative literary works from Independence (1810) to 1900's. The course covers Neoclassicism, Romanticism, Realism/Naturalism, and Modernism and the role of literature in the nation-building process. The course will be taught in Spanish. (Typically offered: Irregular)

SPAN 5403. Spanish American Theatre. 3 Hours.

Historical examination of the theatre in Spanish America, with close analysis particularly of representative works and movements in the 20th century. (Typically offered: Irregular)

SPAN 5463. 20th Century Spanish American Literature. 3 Hours.

Critical survey of major movements and outstanding and representative works in 20th century prose and poetry, from the Mexican Revolution and the avant-garde to the contemporary boom and post-boom. (Typically offered: Irregular)

SPAN 5563. Latino Youth Bilingual Service Learning Project. 3 Hours.

The Latino Youth Bilingual Project is a service learning course for students in Spanish and Latin American and Latino Studies. Readings on Latino education policies and challenges, bilingualism, and the immigrant experience. Students commit from 15 to 30 hours of mentoring Latino youth at local schools during the semester (in addition to class meeting times) and complete a research project on Latino education. Prerequisite: Graduate standing. (Typically offered: Irregular)

SPAN 5703. Special Topics. 3 Hours.

May be offered in a subject not specifically covered by the courses otherwise listed. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

SPAN 575V. Special Investigations. 1-6 Hour.

Special investigations. (Typically offered: Irregular) May be repeated for degree credit.

SPAN 5773. Indigenismo Literature. 3 Hours.

A study of 'indigenismo', an intellectual and literary tradition in Latin America examining the history of exploitation and marginalization of indigenous peoples. Readings include texts by Mariategui, Icaza, Andrade, Asturias, Arguedas, Castellanos, and also 'indigenista' works in music and the plastic arts. (Typically offered: Irregular)

SPAN 5943. U.S. Latino/a Literatures and Cultures. 3 Hours.

Explores the construction and negotiation of Latino/a identities through the study of literary and filmic texts. Theoretical concepts (e.g. latinidad, latinization, intra-latino, cultural remittances) will also be studied. Topics of discussion may include: transnationalism, bilingualism, and interactions between different Latino groups. Taught in Spanish. Prerequisite: Graduate standing. (Typically offered: Irregular)

Statistics (STAT) Courses

STAT 5001L. Statistics Methods Laboratory. 1 Hour.

(Formerly STAT 4001L.) Introduction to the statistical software SAS, including its use for common statistical analyses. Graduate degree credit will not be given for both STAT 4001L and STAT 5001L. (Typically offered: Fall and Spring)

STAT 5003. Statistical Methods. 3 Hours.

Describing Data, Basic Probability, Random variables, Uniform, Normal and Binomial Distributions, Sampling Distributions, Confidence Intervals, Hypothesis testing, Correlation and Regression, Contingency table, Comparing two populations, ANOVA. (Typically offered: Fall and Spring)

STAT 5033. Nonparametric Statistical Methods. 3 Hours.

(Formerly STAT 4033.) Chi square tests. Kolmogorov-Smirnov goodness-of-fit tests, the Mann-Whitney and Wilcoxon 2-sampling tests, and various nonparametric measures of association. Graduate degree credit will not be given for both STAT 4033 and STAT 5033. (Typically offered: Fall, Spring and Summer)

STAT 5043. Sampling Techniques. 3 Hours.

(Formerly STAT 4043.) Considers optimum techniques of simple random, stratified random, cluster, systematic and multistage sampling from finite populations subject to cost precision constraints. Wide range of applications. Graduate degree credit will not be given for both STAT 4043 and STAT 5043. Prerequisite: STAT 5003. (Typically offered: Fall, Spring and Summer)

STAT 505V. Internship in Professional Practice. 1-3 Hour.

(Formerly STAT 405V.) Professional work experience involving significant use of mathematics or statistics in business, industry or government. Graduate degree credit will not be given for both STAT 405V and STAT 505V. Prerequisite: Departmental consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

STAT 5103. Introduction to Probability Theory. 3 Hours.

Fundamentals of probability, distribution theory, and random variables; expected value, moments, and generating functions; classic parametric families of distributions; central limit theorems, inequalities, and laws of large numbers. Prerequisite: MATH 2574 and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

STAT 5113. Statistical Inference. 3 Hours.

Statistical theory of estimation and testing hypothesis. Prerequisite: STAT 5103 and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

STAT 5121L. Introduction to R. 1 Hour.

(Formerly STAT 4101L.) A hands-on introduction to R software, a free and open-source computing environment used for data manipulation and analysis across a broad spectrum of subject areas. Intended for new users. Content begins with simple data manipulation, then complex data structures and common statistical procedures are covered. Graduate degree credit will not be given for both STAT 4101L or STAT 5121L. (Typically offered: Fall)

STAT 5313. Regression Analysis. 3 Hours.

Review of matrix algebra, parameter estimation in linear models, regression diagnostics, collinearity, variable selection, nonparametric regression, Bayesian regression. Prerequisite: STAT 5003 or departmental consent. (Typically offered: Spring)

STAT 5333. Analysis of Categorical Responses. 3 Hours.

Statistical tools to analyze univariate and multivariate categorical responses. Emphasis is given to Generalized Linear Models, including logistic regression and loglinear models. Prerequisite: STAT 5003 or departmental consent. (Typically offered: Spring)

STAT 5353. Methods of Multivariate Analysis. 3 Hours.

Statistical tools to analyze multivariate datasets. Topics include the multivariate linear model, principal component analysis, factor analysis, linear discriminant analysis, clustering, classification and regression trees, support vector machines, nonlinear dimensionality reduction. Prerequisite: STAT 5313, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Spring)

STAT 5373. Experimental Design. 3 Hours.

(Formerly STAT 4373.) Topics in the design and analysis of planned experiments, including randomized block, Latin square, split plot, and BIB designs, use of fractional factorial replication, and repeated measures. Graduate degree credit will not be given for both STAT 4373 and STAT 5373. Prerequisite: STAT 5003. (Typically offered: Spring)

STAT 5383. Time Series Analysis. 3 Hours.

Identification, estimation and forecasting of time series. Spectral analysis including the fast Fourier transform computational aspects are emphasized. Prerequisite: STAT 5103, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall, Spring and Summer)

STAT 5413. Spatial Statistics. 3 Hours.

Applied spatial statistics, covering univariate spatial modeling (kriging), multivariate spatial modeling (cokriging), methods of estimation and inference, and spatial sampling designs. Special relevance to remote sensing. Prerequisite: STAT 5313, and graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Fall)

STAT 5443. Computational Statistics. 3 Hours.

In-depth introduction to computer-based algorithms used for inference and forecasting. Course content may vary by semester. Possible algorithms covered could include: resampling methods (bootstrap), Markov chain Monte Carlo, variable selection in high-dimensional regression (LASSO and LARS), artificial neural networks, ensemble methods (boosting, bagging, random forests), and kernel methods. Prerequisite: STAT 5113 or departmental consent. (Typically offered: Spring)

STAT 610V. Research in Statistics. 1-4 Hour.

Research in statistics. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Irregular)

STAT 639V. Topics in Statistics. 1-3 Hour.

Current state of the art on methodology in one of the topics: multivariate analysis, time series analysis, sequential analysis, factor analysis, or biostatistics. Prerequisite: Graduate standing in mathematics or statistics, or departmental consent. (Typically offered: Irregular) May be repeated for degree credit.

Statistics and Analytics (STAN) Courses

STAN 501V. Special Topics in Statistics and Analytics. 1-6 Hour.

Designed to cover specialized topics not usually presented in depth in regular courses. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

STAN 502V. Research Problems in Statistics and Analytics. 1-6 Hour.

Designed to allow focused study into student's research area. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

STAN 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Theatre (THTR) Courses

THTR 5123. Theatrical Design Rendering Techniques. 3 Hours.

Investigation of drawing and painting methods and materials useful to theatrical designers. Integration of graphic communication with overall production conceptualization will be explored through examination of various theatre styles and periods. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

THTR 5133. Design Portfolio Development. 3 Hours.

Exploration and practice of the skills and techniques used to prepare and present a professional design portfolio and materials in order to successfully interview for a career in the theatre. Prerequisite: Graduate Standing in Theatre or by instructor permission. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

THTR 5143. History of Decor for the Stage. 3 Hours.

An overview of architectural decoration and its application to theatrical design from the Predynastic Period (4400-3200 B.C.) through the Art Deco period with references to contemporary decor. Prerequisite: Graduate standing. (Typically offered: Irregular)

THTR 5151. Singing for Musical Theatre. 1 Hour.

Private study of the singing voice focusing on musical theatre vocal technique and repertoire. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

THTR 5161. Musical Theatre Orchestra. 1 Hour.

A music ensemble class made up of students from all majors who will rehearse together and perform as the pit orchestra for the musical produced by the Department of Theatre. Instrumentation and musical styles vary from show to show. (Typically offered: Irregular) May be repeated for up to 4 hours of degree credit.

THTR 5173. Drafting for the Designer. 3 Hours.

Focuses on industry standard practices of drafting. Students will study and execute design drafting packages for the theatre, including but not limited to Designer Drawings, Painter's Elevations, Props Packages, Lighting Plots and Sections. Prerequisite: Graduate Standing in Theatre or by instructor permission. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

THTR 5183. Scene Design Studio. 3 Hours.

Individual and advanced projects in designing scenery for various theatrical genres as well as non-theatrical applications with emphasis on the design process involving playscript analysis, text analysis, and research. Collaboration skills and advanced rendering techniques will be explored. Contributes to on-going portfolio development. Prerequisite: THTR 4653 or THTR 5653 (formerly THTR 4653) or instructor consent. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

THTR 5193. Scene Technology Studio. 3 Hours.

Individual and advanced projects in scenic techniques with emphasis on scene painting, drafting, rendering, properties design, or scenic crafts as determined by student need. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Spring) May be repeated for up to 9 hours of degree credit.

THTR 5213. Costume Design. 3 Hours.

Advanced study of the art and practice of stage costume design. Emphasis on the expression of character through costume. Development of rendering and research skills. Portfolio development. (Typically offered: Irregular)

THTR 5283. Costume Design Studio. 3 Hours.

Individual and advanced projects in designing costumes for various theatrical genres with emphasis on the design process involving text interpretation, character analysis, and research. Collaboration skills and advanced rendering techniques will be explored. Contributes to on-going portfolio development. Prerequisite: THTR 3213 or THTR 5213 or instructor consent. (Typically offered: Fall) May be repeated for up to 9 hours of degree credit.

THTR 5293. Costume Technology Studio. 3 Hours.

Individual and advanced projects in costume construction and techniques with emphasis on flat pattern, draping, corsetry, tailoring or costume crafts as determined by student need. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Spring) May be repeated for up to 9 hours of degree credit.

THTR 5353. Stage Lighting Technology. 3 Hours.

The thorough examination of the technology of equipment that supports the art of stage lighting design: theory, operating principles and specification of lamps, fixtures, control systems and special effect hardware will be explored. Prerequisite: Graduate standing. (Typically offered: Irregular)

THTR 5383. Lighting Technology Studio. 3 Hours.

Individual and advanced projects in lighting technology with emphasis on light sources, lighting control, equipment design and specification and the mechanics of lighting. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Spring) May be repeated for up to 9 hours of degree credit.

THTR 5393. Lighting Design Studio. 3 Hours.

Individual projects in lighting design with emphasis on the design process involving script interpretation, design aesthetics and research. Lighting design applications to a variety of venues will be studied. Contributes to on-going portfolio development. Prerequisite: Graduate standing or instructor consent. (Typically offered: Fall) May be repeated for up to 6 hours of degree credit.

THTR 5413. African American Theatre History – 1950 to Present. 3 Hours.

(Formerly THTR 4463.) A chronological examination of African-American theatre history from 1950 to the present through the study of African-American plays and political/social conditions. Upon completion of this course the student should be familiar with the major works of African-American theatre and have a deeper understanding of American History. Graduate degree credit will not be given for both THTR 4463 and THTR 5413. (Typically offered: Spring)

THTR 542V. Graduate Acting Studio. 1-3 Hour.

Provides actors with intensive opportunities to explore specific aspects of their craft. Sample topics include characterization, Chekhov, Pinter, Brecht, improvisation and mask work. Topics vary each semester. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular) May be repeated for up to 18 hours of degree credit.

THTR 5432. Graduate Voice and Speech I. 2 Hours.

Teaches how to build clear vocal production using proper breath support, grounded in the Alexander technique. Emphasis on the connection between breath and thought, learning to undo inadequate vocal habits, and vocal hygiene. Prerequisite: Graduate standing in Theatre. (Typically offered: Fall) May be repeated for up to 4 hours of degree credit.

THTR 5443. Graduate Acting: Period Styles. 3 Hours.

Styles of acting in relation to French and English Dramatic Literature (16th-19th Centuries). This course also examines the historical and cultural influences that shaped each genre. A period dance component is included. Prerequisite: Graduate standing in Theatre. (Typically offered: Spring)

THTR 545V. Musical Theatre Performance. 1-3 Hour.

Theory and techniques of performing a singing role for the theatre. Integrates acting and vocal techniques and examines the relationship between score and text. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5463. Audition Techniques. 3 Hours.

A thorough study and practical application of audition skills and techniques. This course will equip the student with prepared audition pieces and experience in cold reading, on-camera work, and improvisation. The course also explores the practical needs of the actor; from how to get an audition to how to prepare a resume. Prerequisite: Graduate standing in Theatre. (Typically offered: Fall, Spring and Summer)

THTR 5473. Graduate Acting: Shakespeare. 3 Hours.

Analysis of Shakespeare for performance. Work will include the plays of Shakespeare and his contemporaries, including cultural and theatrical contexts required for understanding the scripts. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 548V. Meisner Technique I. 1-3 Hour.

Acting theory and exercises of Sanford Meisner, including repetition work, connecting with partner, three moment game, activities, and emotional preparation. (Typically offered: Irregular)

THTR 549V. Meisner Technique II. 1-3 Hour.

Continuation of Meisner Technique I. Incorporation of theory and advanced exercises of the Meisner Technique into the playing of text. Prerequisite: THTR 548V. (Typically offered: Irregular)

THTR 5511. Alexander Technique Lessons. 1 Hour.

Students will become aware of habitual patterns of tension and how these patterns interfere with performance, learning, and overall health. The Technique offers practical skills for improving coordination and for re-gaining a sense of ease of movement in all activities. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

THTR 5523. Writing for Television and Screen. 3 Hours.

Advanced study and practice in writing for the small and big screen, with focus on writing for television. This writing workshop is an investigation into the form, structure, and vocabulary of writing for television, designed to give students tools, strategies, and practice in writing for television. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

THTR 5533. Graduate Playwriting: Special Projects. 3 Hours.

Advanced study and practice in the area of playwriting. The area of concentration will be determined by the student's specific writing project(s). Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 18 hours of degree credit.

THTR 5543. Creating a One-Person Show. 3 Hours.

Actors learn to use compelling personal experiences and interests in the creation of a unique one-person show. Includes exploration in characterization, staging and playwriting. Culminates in the public presentation of a short one-person show. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5552. Graduate Voice and Speech II. 2 Hours.

A continuation of Graduate Voice and Speech I, exploring more closely the connection between breath support and volume, pitch, range, resonance and articulation. Prerequisite: THTR 5432. (Typically offered: Spring)

THTR 5562. Graduate Voice and Speech III. 2 Hours.

Continuation of Graduate Voice and Speech II, focusing on the classification of vowels and consonants according to the International Phonetic Alphabet (IPA). Prerequisite: THTR 5552. (Typically offered: Irregular)

THTR 5572. Graduate Voice and Speech IV. 2 Hours.

Continuation of Graduate Voice and Speech III. Extension of the application of the IPA to the analysis of different accents of individuals for whom English is a second language. Approximately eight dialects of English will be examined. Prerequisite: THTR 5562. (Typically offered: Irregular)

THTR 5593. Acting and Directing Absurdist Theatre. 3 Hours.

This course focuses on a particular dramatic style that developed following World War II: Absurdism. In scene presentation projects, students will grapple with the unusual challenges acting and directing these plays, as well as explore the cultural contexts, philosophies and theatrical traditions that led to their invention. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5643. Devised Theatre. 3 Hours.

Explores performer-created works developed through group dynamics, with emphasis on innovative source materials and inventive theatrical approaches. (Typically offered: Irregular)

THTR 5653. Scene Design. 3 Hours.

(Formerly THTR 4653.) Theory and practice in the art of scenic design, including historical and contemporary styles and procedures. Graduate degree credit will not be given for both THTR 4653 and THTR 5653. Prerequisite: THTR 1323, THTR 2313 and THTR 2513. (Typically offered: Fall Odd Years)

THTR 5663. Directing Modern Drama. 3 Hours.

Studio course exploring the challenges of directing post-19th Century dramatic literature. Individual projects in collaboration with actors. Sample dramatic literature includes styles such as Realism, Expressionism, Absurdism, post-Modernism and Epic Theatre. Topics vary each semester. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

THTR 5673. Adapting and Directing Non-Theatrical Texts. 3 Hours.

Offers directors practice in the adaptation and staging of non-theatrical prose, poetry and current events. Individual projects in collaboration with actors. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5683. Directing Studio. 3 Hours.

Hands-on exploration into the direction of historical and contemporary texts and styles, including Greek, Roman, Shakespeare, Realism, American and international scripts and the adaptation of non-theatrical material. Topics vary each semester. Includes discussion and investigation of the theatrical arts and collaborative and production processes. Prerequisite: MFA Directing student or instructor consent. (Typically offered: Fall and Spring) May be repeated for up to 6 hours of degree credit.

THTR 5691. Scene Study for Directing Studio. 1 Hour.

Participation as an actor in scenes presented for the graduate Directing Studio course. Varying historical and contemporary texts and styles each semester. Class meets one hour each week, plus outside rehearsals, depending on casting. Prerequisite: Instructor consent. (Typically offered: Fall and Spring) May be repeated for up to 4 hours of degree credit.

THTR 5713. Directing Classics. 3 Hours.

Explores the challenges of directing classic texts. Individual projects in collaboration with actors on a wide variety of pre-20th Century dramatic literature. Topics vary each semester. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular) May be repeated for up to 12 hours of degree credit.

THTR 5723. History of the Theatre I. 3 Hours.

A comprehensive study of the theatre in different cultures and ages, as an institution, as an art, and as a vision of life. (Typically offered: Fall)

THTR 5733. History of the Theatre II. 3 Hours.

A continuation of THTR 5723. (Typically offered: Spring)

THTR 5763. Dramatic Criticism. 3 Hours.

Analysis of critical theories from Aristotle to the present; interrelationships of theatre disciplines as well as the influence of the church, state, and press on dramatic criticism. Prerequisite: Senior or graduate standing. (Typically offered: Irregular)

THTR 5773. Script Analysis. 3 Hours.

Introduces the fundamentals of dramatic structure, in plays from the classical era to the present, with emphasis on how a dramatic work conveys cultural meaning and how it informs the production approaches of actors, directors, and designers. (Typically offered: Irregular)

THTR 5783. Viewpoints. 3 Hours.

Exploration and application of the Viewpoints movement technique. Prerequisite: Graduate standing in Theatre. (Typically offered: Irregular)

THTR 5833. Scene Painting. 3 Hours.

(Formerly THTR 4833.) A studio class in painting techniques for the theatre. Exercises in color, textures, styles, and execution. Graduate degree credit will not be given for both THTR 4833 and THTR 5833. Prerequisite: THTR 1323 and THTR 2313. (Typically offered: Spring Odd Years) May be repeated for up to 6 hours of degree credit.

THTR 590V. Independent Study. 1-18 Hour.

Individually designed and conducted programs of reading and reporting under guidance of a faculty member. (Typically offered: Fall, Spring and Summer) May be repeated for up to 18 hours of degree credit.

THTR 591V. Special Topics. 1-3 Hour.

Classes not listed in the regular curriculum, offered on demand on the basis of student needs and changes within the profession. Prerequisite: Graduate standing in Theatre or Instructor consent required. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

THTR 592V. Internship. 1-6 Hour.

Supervised practice in the various arts and crafts of the theatre (e.g. full design responsibility for a production; box office management; actor apprenticeship in a professional company). (Typically offered: Irregular)

THTR 5953. Theatre Study in Britain. 3 Hours.

(Formerly THTR 4953.) Study of the components of stage production through attending and critiquing a wide variety of classical, modern, and avant garde theatre productions in England; includes tours of London and historical British sites and seminars with British theatre artists. Graduate degree credit will not be given for both THTR 4953 and THTR 5953. (Typically offered: Summer)

THTR 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for degree credit.

THTR 6111. Academic Research I. 1 Hour.

Introduces students to the practice and discipline of academic writing and research. Students are required to write papers throughout the course, in order to become familiar with the formatting criteria of academic writing. Prerequisite: Admission to the MFA Program. (Typically offered: Fall, Spring and Summer)

THTR 6121. Academic Research II. 1 Hour.

The class is intended to finalize to the submission of the thesis proposal at the end of the semester for faculty approval. Lectures and class discussions are designed to further expand students' skills in research, academic writing and formatting requirements. Each student will be assigned a thesis advisor. Prerequisite: THTR 6111. (Typically offered: Fall, Spring and Summer)

THTR 6132. Introduction to the Creative Process. 2 Hours.

Introduces the creative process as a form of practice through exploring various strategies for generating performative material, including the initiation of an impulse, an action or a concept. Involves studio work, exercises, automatic writing, design, and numerous modes of improvisation. (Typically offered: Fall, Spring and Summer)

THTR 6142. Extension and Analysis of the Creative Process. 2 Hours.

Introduction to form and genre via Commedia dell'Arte where students will improvise and construct lazzi within the constraints of a specific form. The fundamental role of musicality and rhythm in dramaturgy will be underlined as students move towards more complex compositional forms. Prerequisite: THTR 6132. (Typically offered: Fall, Spring and Summer)

THTR 6323. Stylized Theatre Practices. 3 Hours.

Constellated around the notion of Composed Theatre and draws on the psycho-physical vocabulary and various dramaturgical approaches. Focuses on generating textual material and composition, with a view to elaborating personal projects. Provides practical and conceptual tools that enable solutions to be found to acting and dramaturgical challenges of creating new work. Prerequisite: THTR 6132. (Typically offered: Fall, Spring and Summer)

THTR 6333. Devised Theatre Practices. 3 Hours.

Works towards an understanding of what 'composed theatre' means focusing on the use of musical concepts and strategies to arrive at a fully formed performance. Focus on the creation of student-driven devised performance projects. Each student will be responsible for devising a short piece to professional standards for public performance. (Typically offered: Fall, Spring and Summer)

THTR 6346. Devised and Physical Theatre Internship. 6 Hours.

Occurs off-site with professional companies. Devised and physical theatre techniques are investigated that supplement or complement the previous semester's study. Requires a journal, a final paper or a final project of the learned technique studied. Prerequisite: Must complete at least 10 hours of credit in 5000 level THTR coursework. (Typically offered: Summer) May be repeated for up to 12 hours of degree credit.

THTR 6351. Improvisation and Text in Commedia dell'Arte. 1 Hour.

Delves into the aesthetic, literary, and technical structures in which are rooted the dramaturgical components of Commedia dell'Arte. Focuses on the processes of improvisation, and makes use of sources such as scenarios, acting treatise and repertoires, lazzi, and iconographic documents. Prerequisite: THTR 6741. (Typically offered: Fall, Spring and Summer)

THTR 6414. Basic Skills of the Physical Actor. 4 Hours.

Designed to enable actors to develop the physical, vocal, musical and rhythmic skills necessary for their craft, including movements, contemporary dance, voice work and music. Introduces the notion of collaborative theatre and the principles of a trans-disciplinary approach to training. Students will create and perform in Italian. Prerequisite: Admission to the MFA program. (Typically offered: Fall, Spring and Summer)

THTR 6423. Extended Skills of the Physical Actor. 3 Hours.

Presents students with demanding work in movement and vocal skills that move towards character-building, autonomous training methods and a deeper understanding of how musicality and rhythm are a key to both individual and ensemble performance. Fundamental design principles are introduced underscoring improvisation and future composition. Prerequisite: THTR 6414. (Typically offered: Fall, Spring and Summer)

THTR 6432. Advanced Skills of the Physical Actor. 2 Hours.

Presents pathways towards generating work both as an ensemble and as soloists. More complex expressive skills are investigated: text work, dance choreography, movement analysis and impulse, musical 'scoring' and dynamo-rhythms in performance. Students encounter advanced design principles that will inform devising. Prerequisite: THTR 6423. (Typically offered: Fall, Spring and Summer)

THTR 6441. Beyond Techniques. 1 Hour.

Tracks students in their final semester focusing on maintaining core fitness and readiness on a physical and vocal level. Students develop further skills in devising, writing and composition in readiness for their thesis projects. Prerequisite: THTR 6432. (Typically offered: Fall, Spring and Summer)

THTR 6471. The Body as Sign. 1 Hour.

Explores the connections between 'meaning' and 'illusion' in examples drawn from theatre, dance and other art forms. Emphasis on the connections displayed by the actor's body. Classes will investigate plays and works of art by focusing on the role the body assumes as a medium of meanings through illusion. Prerequisite: THTR 6731. (Typically offered: Fall, Spring and Summer)

THTR 6513. Ensemble Creation. 3 Hours.

Reinforces the need to maintain a cohesive ensemble where a daily 'routine' is part of a company ethic and practice. Students re-visit their ensemble and individual or small-group works devised during the previous courses. They further refine and define these works under faculty mentoring. Prerequisite: THTR 6333. (Typically offered: Fall, Spring and Summer)

THTR 6611. Professional Aspects of Theatre. 1 Hour.

Introduction to industry through research of professional companies producing work that contains devised and physically - based material. Also covers elements of grant writing, producing on a budget, publicity and promotion. Prerequisite: THTR 6346. (Typically offered: Fall, Spring and Summer)

THTR 6711. Theory, History, and Aesthetics of Physical Theatre I. 1 Hour.

Investigates key physical theatre practitioners within both the realm of classical and modern theories and the conceptual sphere emerging from significant contemporary theatre. Intended to make students aware of the political value of their artistic vision as an aesthetic expression of contemporary society. Prerequisite: Admission to the MFA Program. (Typically offered: Fall, Spring and Summer)

THTR 6721. Theory, History, and Aesthetics of Physical Theatre II. 1 Hour.

Continuation of Aesthetics and History of Physical Theatre I. Focuses on significant contemporary physical theatre practitioners. Investigates productions, techniques, and poetics of current physical theatre companies presently operating. Prerequisite: THTR 6711. (Typically offered: Fall, Spring and Summer)

THTR 6731. Theory, History, and Aesthetics of Physical Theatre III. 1 Hour.

Provides insights into popular theatre practices and practitioners in the broader context of physical theatre. Focuses on the aesthetic, social, political, and economic concerns related to diverse significant popular theatre practices, which were, and still are, alternative to mainstream forms of entertainment: buffoon, clown, and cabaret, among others. Prerequisite: THTR 6721. (Typically offered: Fall, Spring and Summer)

THTR 6741. Non-Western Theatre. 1 Hour.

Introduces students to non-Western theatrical forms, concentrating on the traditional, primarily the theatre of three Asian countries: Japan, China, and India. Explores production methods, performance styles, audiences and social milieus, and will challenge the perception of theatre forms usually not included in the Western canon. Prerequisite: THTR 6111. (Typically offered: Fall, Spring and Summer)

THTR 6811. Technical Theatre for the Physical Performer I. 1 Hour.

Introductory, broad based study of technical theatre focusing on contemporary practices in stage lighting, projection, sound, costume and automation. Emphasis will be placed on the blending of old and emerging technology for use by the physical performer. Corequisite: Lab component. Prerequisite: Admission to the M.F.A. Program. (Typically offered: Fall, Spring and Summer)

THTR 6821. Technical Theatre for the Physical Performer II. 1 Hour.

Introductory, broad based study of technical theatre focusing on equipment used in stage lighting, projection, sound, costume and automation. Emphasis will be placed on the use of standard theatrical equipment for the theatre as well as software typically used in the creation and presentation of live theatre. Corequisite: Lab component. Prerequisite: THTR 6811. (Typically offered: Fall, Spring and Summer)

THTR 6913. Special Topics in Devised and Physical Theatre. 3 Hours.

Topics in the areas of theatre that result in the creation of a devised work in dramatic literature, performance, or design. (Typically offered: Fall, Spring and Summer)

U A Clinton School (UACS)

Courses

UACS 502V. Advanced Problems in Public Service. 1-3 Hour.

Provides an opportunity for individual study. (Typically offered: Irregular)

UACS 5101. Ethical and Legal Dimensions of Public Service. 1 Hour.

This course will provide an overview of the primary ethical principles and legal concepts that guide difficult decisions in the public realm. Traditional academic study of ethical and legal theory will be combined with practical approaches to problem solving. Students will explore issues of economic, political, and social justice through case studies of current issues. Students will construct cases that are relevant to their own fields and present them to the class, identifying ethical and legal constraints on decision-making and implementation. (Typically offered: Irregular)

UACS 5303. Communication Processes and Conflict Transformation. 3 Hours.

The course is designed to increase the student's personal communication effectiveness as a leader and public servant, and to enable students to understand the application of communication processes in the public arena. (Typically offered: Irregular)

UACS 5313. Dynamics of Social Change. 3 Hours.

The course deals with the elements of social change in a democratic society, and how these intersect with and are affected by economic and political forces. A critical examination of the various justifications for promoting or discouraging social change will be undertaken, and the inherent strengths and weaknesses of these various approaches will be analyzed. Real-world cases will be used, and a culminating exercise will be a strategic assessment of the Lower Mississippi Delta. (Typically offered: Irregular)

UACS 5323. Leadership in Public Service. 3 Hours.

This course is designed to increase students' knowledge of leadership concepts and best practices, provide opportunities and experiences that improve leadership skills and techniques, and enhance capabilities in organizational management. Students will assess their leadership strengths and weaknesses, as well as develop an action plan to match their career goals. They will improve knowledge and skills in building diverse teams, in initiating/managing change, in addressing uncertainty, and in leading non-governmental organizations. At the end of the course, students should be able to design leadership strategies to successfully address a spectrum of issues in public service and in promoting the community good. (Typically offered: Irregular)

UACS 5333. Analysis for Decision Making In Public Service. 3 Hours.

This course is intended to provide students with analytical tools that enhance their skills in diagnosing problems and formulating solutions within organizations and communities. Instruction will focus on evaluating community assets as a balance to assessing community need. Underlying values of social justice and collaborative problem-solving provide a benchmark for these activities. Students, working in teams, will be challenged to apply their skills to cases related to affordable housing and homelessness. (Typically offered: Irregular)

Walton College of Business (WCOB)

Courses

WCOB 5023. Sustainability in Business. 3 Hours.

The course focuses on theoretical and practical bases for pursuing sustainability in business and society. (Typically offered: Fall and Spring)

WCOB 510V. Special Topics in Business. 1-3 Hour.

Special business topics of an interdisciplinary nature. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WCOB 5843. Cross-Sector Collaboration for Sustainability. 3 Hours.

This course explores how organizations in the three sectors of society work together in value creation by addressing social and environmental problems. Focusing on business and nonprofit organizations, we investigate the forces that bring about and influence these collaborations from practical and theoretical perspectives, and managerial responses to collaboration challenges. Prerequisite: Graduate Status. (Typically offered: Irregular)

WCOB 6111. Seminar in Business Administration Teaching I. 1 Hour.

This course in college level teaching is designed for graduate students and new college teachers with specific emphasis on the Business Administration learning and classroom management. The purpose of this course is to introduce graduate students to principles of teaching and learning and to prepare these future teachers to lifelong learners in the classroom as teachers. Prerequisite: Graduate standing. (Typically offered: Fall)

World Languages, Literatures and Cultures (WLLC)

Courses

WLLC 5023. Languages, Cultures, and Teaching with Technology. 3 Hours.

This course provides graduate students with innovative ways to teach and communicate through the use of modern technologies as applied to second languages. Topics of discussion include instructional systems design, Web 2.0 technologies, presentation technologies, online facilitation, and pedagogical strategies for using technological tools in language and culture courses. Prerequisite: Graduate standing. (Typically offered: Fall)

WLLC 5033. Languages, Cultures and Teaching with Video. 3 Hours.

This course provides graduate students with the knowledge and skills needed to teach and communicate through the use of video as applied to second languages. Topics of discussion include instructional systems design, development of strong pedagogical strategies for teaching with film, analysis of research focused on subtitling, learning strategies, mental effort, and language and culture development, as well as some videotaping and editing. (Typically offered: Spring)

WLLC 504V. Translation Workshop. 1-6 Hour.

Problems of translation and the role of the translator as both scholar and creative writer; involves primarily the discussion in workshop of the translations of poetry, drama, and fiction done by the students, some emphasis upon comparative studies of existing translations of well-known works. Primary material will vary. Prerequisite: Reading knowledge of a foreign language. (Typically offered: Irregular)
This course is cross-listed with ENGL 5043.

WLLC 5063. Teaching Foreign Languages on the College Level. 3 Hours.

Focus on basic methodological concepts and their practical application to college foreign language instruction. (Typically offered: Irregular)

WLLC 5463. Descriptive Linguistics. 3 Hours.

A scientific study of language with primary emphasis on modern linguistic theory and analysis. Topics include phonology, morphology, syntax, semantics, language acquisition, and historical development of world languages. (Typically offered: Fall)
This course is cross-listed with ANTH 5473, ENGL 5463.

WLLC 5723. Language Learning Research and Theory. 3 Hours.

Introduces research and theory in the field of second language learning and acquisition. Develops the ability to critically read and assess published research, while connecting with current theories of how languages are learned. Also introduces the process of carrying out research in language learning. A research project proposal is required. (Typically offered: Irregular)

WLLC 575V. Special Investigations. 1-6 Hour.

Special investigations in world languages, literatures and cultures. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLLC 6553. Applied Linguistics Seminar. 3 Hours.

Research and discussion in areas of applied linguistics ranging from discourse analysis, literacy, language pedagogy, and language planning to translation theory. Subject matter changes depending on student interest and faculty expertise. Prerequisite: WLLC 5463 or equivalent introduction to linguistics. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

World Literature (WLIT)

Courses

WLIT 5123. Survey of Russian Literature from Its Beginning to the 1917 Revolution. 3 Hours.

(Formerly WLIT 4123.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English. Graduate degree credit will not be given for both WLIT 4123 and WLIT 5123. (Typically offered: Irregular)

WLIT 5133. Survey of Russian Literature Since the 1917 Revolution. 3 Hours.

(Formerly WLIT 4133.) The instructor will discuss the historical and cultural backgrounds while focusing on major writers and will deal with literature as an outlet for social criticism. There will be textual analysis. It will be taught in English with readings in English. Graduate degree credit will not be given for both WLIT 4133 and WLIT 5133. (Typically offered: Irregular)
This course is cross-listed with RUSS 5133.

WLIT 5193. Introduction to Comparative Literature. 3 Hours.

Literary theory, genres, movements, and influences. (Typically offered: Irregular)

WLIT 5443. Queer Theor(ies). 3 Hours.

Introduction to the complex history and evolution of Queer Theory into Queer Theor(ies) from Foucault to the Present. (Typically offered: Irregular)
This course is cross-listed with GNST 5443.

WLIT 5523. The Quran as Literature. 3 Hours.

The Quran as literary text: its style and form, historical context, translation, issues, communities of interpretation, and comparative perspectives. Course's integrated approach includes translations of literature originally in Arabic. All readings in English; students with reading abilities in Arabic encouraged to read original text. (Typically offered: Irregular)

WLIT 5623. The Bible as Literature. 3 Hours.

The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms. (Typically offered: Irregular)
This course is cross-listed with ENGL 5623.

WLIT 575V. Special Investigations on World Literatures and Cultures. 1-6 Hour.

Independent study of a special topic in world literatures and cultures. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 5993. African Literature. 3 Hours.

(Formerly WLIT 4993.) A study of modern African fiction, drama, poetry, and film from various parts of Africa in their cultural context. Works are in English or English translation. Graduate credit will not be given for both WLIT 4993 and WLIT 5993. (Typically offered: Irregular)

WLIT 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

WLIT 603V. Special Studies in Comparative Literature. 1-6 Hour.

Special studies in comparative literature. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 6703. Psychoanalysis and Culture. 3 Hours.

Readings of key texts in Psychoanalytic thought and cultural criticism including Freud, Lacan, Kristeva, Certeau, Zizek, and others. Selections of Psychoanalytic approaches to literature, film and gender and trauma studies. (Typically offered: Irregular)

WLIT 6713. Literature of Spain, 711-1615 C.E.. 3 Hours.

Examines the multiple cultural traditions of Spain between 711-1615 C.E. and train to produce scholarship pertinent to the field. Integrated approach includes English translations of literature originally in Arabic (50%+ of content), Hebrew, Spanish, French. Students with reading abilities in original languages encouraged to read original text. (Typically offered: Irregular)

WLIT 6803. Postcolonial Theory and Subaltern Studies. 3 Hours.

Seminar examining the geopolitical (imperial, colonial and national) implications of knowledge and culture. Selected readings of early postcolonial texts by Cesaire, Fanon, and Fernandez Retamar, as well as more recent texts by Said, Spivak, Bhabha, Mignolo, Beverly and Chakrabarty among others. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 690V. Seminar. 1-6 Hour.

Seminar. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

WLIT 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

Glossary

Academic Dismissal. An academic status (<http://catalog.uark.edu/undergraduatecatalog/academicregulations/academicprobationsuspensionanddismissal/>) resulting from unsatisfactory grades in which students are not permitted to enroll at the university until approved through an appeal process.

Academic Probation. An academic status (<http://catalog.uark.edu/undergraduatecatalog/academicregulations/academicprobationsuspensionanddismissal/>) resulting from unsatisfactory grades.

Academic Suspension. An academic status (<http://catalog.uark.edu/undergraduatecatalog/academicregulations/academicprobationsuspensionanddismissal/>) for unsatisfactory grades in which students are not permitted to register for courses for a specified time period.

Act 1052/467. Section 21 of Arkansas Act 467 of 1989 specifies that all first-time entering freshmen who are enrolled in a bachelor's degree program will be placed in either college-level credit courses in English and mathematics or developmental courses in English composition, reading, and mathematics on the basis of their scores on specified tests. Find out more in the Registration (<http://catalog.uark.edu/undergraduatecatalog/orientationandregistration/>) section of the catalog.

Activity Course. Course devoted to participation in, knowledge of, or performance of some form of physical activity.

Add. See *Drop/Add* below.

Advance Registration. A period of time scheduled during a regular (fall or spring) semester that allows currently enrolled students to register for the next regular semester. In addition, advance registration for the summer sessions is scheduled during the spring semester.

Applied Instruction. A course that integrates both the teaching and hands-on application of knowledge or information; attends to the practical

and utilitarian function of the subject (distinguished from theoretical). Examples may include: livestock judging team, music and art courses, cooperative education, and experiential learning.

Apprenticeship/Externship. Experiential learning opportunity to give students practical exposure and training in a career field. This is generally off-campus, supervised, and designed to prepare students for the transition from school to career.

Area Studies. Interdisciplinary study of geographical or cultural areas. Topics include the history, geography, politics, culture, language, and literature of the area. Generally, an area study is a minor or a second major. Examples of area studies include African and African American studies, Latin American and Latino studies, and Middle East studies.

Audit. To take a course without credit.

Adviser. A faculty or staff member assigned to a student to advise that student on academic matters that include degree requirements and selection of courses.

Certification/Licensure Requirements. The set of course, hour, and other academic requirements that must be completed to receive certification/licensure such as certification to teach in the public schools.

Class Schedule. List of courses and sections for a specific semester, including names of instructors; day, hour, and place of class meetings; and detailed registration procedures. The class schedule is available online.

Clinical Rotation/Instruction. Course that takes place in a clinical setting, including practice labs, hospitals, and other agencies; students apply methods and principles of a clinical discipline.

College or School. One of ten major divisions within the university that offers specialized curricula.

Combined Major.¹ A combination of subsets of two primary discipline specific requirements (each of which is typically 15 to 24 hours and less than the number required for a major) which together constitute the major in a program of study leading to one bachelor's degree with a combined major in two disciplines. For example, a Bachelor of Arts degree with a combined major in English and journalism.

Concentration. A subset of requirements within the discipline-specific (field of study or major) requirements in a program of study leading to a graduate or bachelor's degree. Examples are the Doctor of Philosophy degree with physics as the field of study and a concentration in neuroscience or a Bachelor of Music degree with a major in music and a concentration in jazz studies. Concentrations will print on the transcript.

Consent. A prerequisite that requires the student to obtain approval from the instructor or the department before he or she will be allowed to register for the course.

Core. Core is a set of required coursework specified for students at the college/school, department, or program/area level. Core is what is required for all students at that level or in that program. Hours will vary depending upon the major. Core and major requirements are usually stated in terms of specific courses or lists of courses from which any course chosen will meet the requirement. The "list" may actually be a defined set such as lower-level courses or upper-level courses; courses in the department, in the program, or in the college; or courses identified by one or more course, program, or department codes.

Elective courses may involve a greater or lesser degree of student choice. A general elective course could be one that is needed to complete the number of hours required for the degree when no other requirements remain to be met. A free elective course may be one that is not needed to complete either course requirements or hour requirements.

Corequisite. A course that must be taken at the same time as the course described.

Correspondence. See *Self-Paced (Correspondence)* below.

Course. A unit of academic instruction.

Course Deficiencies. Lacking required units of study in high school. Find out more in the Placement and Proficiency portion (<http://catalog.uark.edu/undergraduatecatalog/enrollmentservices/placementandproficiencytests/>) of the Enrollment Services section of the catalog.

Course Load. The number of semester credit hours a student may schedule in a given term.

Credit Hour. See Academic Policy 1200.40 (<https://provost.uark.edu/policies/120040.php>) for university's credit hour definition.

Cumulative Grade-Point Average. An average computed by dividing the total number of grade points earned by the total number of credit hours attempted in all courses for which grades (rather than marks) are given.

Curriculum. A program of courses comprising the formal requirements for a degree in a particular field of study.

Degree Program. The program of study defined by sets of academic requirements that lead to a degree that the university is authorized to offer. Undergraduate degree requirements are typically stated in terms of numbers of credit hours and specific courses at university, college/school, and discipline levels. Graduate degree requirements are typically stated in terms of numbers of credit hours and specific courses at discipline levels. Examples are a Bachelor of Science degree program, which typically has a minimum of 120 hours; a Master of Arts degree program, which typically has a minimum of 30 hours; and a Doctor of Philosophy degree program, which typically has a minimum of 60 hours although hours vary.

Department. Division of faculty or instruction within a college, such as Department of Accounting within the Sam M. Walton College of Business.

Dependent Major. See *Second Major* below.

Dissertation/Thesis Research. Research conducted and submitted in support of candidature for a degree or professional qualification; a formal treatise presenting the results of study submitted in partial fulfillment of the requirements of an advanced degree; process requires intensive interaction between student and professor.

Double Degree Program. A program of study that includes one set of university requirements and two sets of college or school and primary discipline-specific requirements and leads to two different bachelor's degrees with two different majors. Such a program could, for example, lead to a Bachelor of Science degree with a major in chemistry and a Bachelor of Science in Chemical Engineering degree. Such programs are comparatively rare, and hours required to complete them vary, depending upon overlap in requirements.

Double Major.¹ The two complete sets of primary discipline-specific requirements (typically consisting of a minimum of 30 hours each) constituting the two majors within a program of study leading to one

bachelor's degree with two complete majors. For example, a Bachelor of Arts degree with a double major in Spanish and French.

Drill. Supplemental instruction or practice using repetition or discussion.

Drop/Add. Dropping or adding of select courses while still remaining enrolled in the university. This can only be done during specified times as published in the academic calendar (<http://registrar.uark.edu/academic-dates/academic-semester-calendar/>). See also *Withdrawal* below.

Eight-Semester Degree Completion Program. Most majors offered by the University of Arkansas can be completed in eight semesters, and the university provides plans that show students which classes to take each semester in order to finish in eight semesters. A few undergraduate majors either require a summer internship or fieldwork or are five-year professional programs, and may therefore not qualify for the eight-semester degree completion program.

Elective. Elective courses may involve a greater or lesser degree of student choice. A general elective course could be one that is needed to complete the number of hours required for the degree when no other requirements remain to be met. A free elective course may be one that is not needed to complete either course requirements or hour requirements.

Equivalent. A course allowed in place of a similar course in the same academic discipline. May require approval by an academic dean.

Externship. See *Apprenticeship/Externship* above.

Fees. Charges, additional to tuition, that cover specific university services, programs, facilities, activities and/or events. Find out more in the undergraduate Fee and Cost Estimates (<http://catalog.uark.edu/undergraduatedcatalog/feehandcosts/>) section or the graduate Fee and Cost Estimates (p. 416) section.

Field of Study. The primary discipline-specific (or multidisciplinary or interdisciplinary) set of requirements in a graduate program of study. The field of study typically consists of a minimum of 30 hours at the master's degree level, of 30 hours beyond the master's degree at the educational specialist level, and of 96 hours for the doctor of education degree. Field of study hour requirements vary more widely for the doctor of philosophy degree, but 60 hours is typical. For example, a Master of Arts degree in history, a Master of Arts in Teaching degree in teacher education, an Education Specialist degree in curriculum and instruction, a Doctor of Education degree in higher education, a Doctor of Philosophy degree in business administration.

Field Studies. Hands-on study undertaken outside the laboratory or place of learning, usually in a natural environment or among the general public. Examples may include archeological and geological field studies.

Focused Studies. A set of courses that a student may elect to take as part of the major requirements that provides focus in a particular area related to the major. Completing a focused study is not required for the major, but serves as a guide for students who want to further specialize their studies. Focused studies do not need ADHE approval and do not appear on the transcript.

Grade Points. Points per semester hour assigned to a grade (not a mark), indicating numerical value of the grade. The grade-point average indicates overall performance and is computed by dividing the total number of grade points earned by the number of semester hours attempted.

Grade Sanction(s). A penalty for academic dishonesty. Grade sanctions may consist of either a grade of zero or a failing grade on part or all of a submitted assignment or examination or the lowering of a course grade, or a failing grade of XF to denote failure by academic dishonesty.

Hazing. Any activity that is required of an individual that may cause mental or physical stress and/or embarrassment when in the process of joining or belonging to any organization.

Independent Study. Project collaboratively designed by the instructor and student to pursue an area of study not covered by the established curriculum; typically completed without class attendance but through formal supervision by an instructor.

Internship. A formal program that provides practical experience in an occupation or profession; applied, monitored, and supervised, field-based learning experience for which the student may or may not be paid; may include field work/experience, supervised courses, student teaching, and cooperative education; provides opportunities for students to gain experience in a career field.

Intersession. A two-week mini-session that is held at the beginning of the regular fall, spring, and summer terms. Coursework during an intersession is very concentrated and intensive. Intersession classes are not available to new freshmen.

Laboratory. Course meeting in a defined physical setting for the hands-on application of methods and principles of a discipline; credit-bearing section which requires a registration separate from the lecture component of the course.

Lecture. A class session in which an instructor speaks on a specific topic.

Lecture/laboratory. Lecture course which integrates a lab component as part of the same course registration.

Major. The primary discipline-specific (or multidisciplinary or interdisciplinary) set of requirements in an undergraduate program of study. The major typically consists of a minimum of 30 hours and identifies by name a specific degree area. For example, a Bachelor of Arts degree with a major in English or a Bachelor of Science in Business Administration degree with a major in accounting.

Minor. The lesser set of discipline-specific (or multidisciplinary or interdisciplinary) requirements in an undergraduate program of study. The minor typically consists of a minimum of 15 hours or more in a designated discipline.

Noncredit Course. A course for which no credit is given. (Some credit courses will not count toward degrees.)

Overload. A course load of more semester hours than a student is normally permitted to schedule in a given period.

Practicum. Involves supervised activities emphasizing practical application of theory, especially one in which a student gains exposure to a field of study; generally required as part of the program curriculum.

Pre-Professional Requirements. The set of course, hour, and other academic requirements that must be completed before entry into a school, a program of study, or an advanced level of a program of study, either at the U of A or at another institution.

Prerequisite. A course or requirement that must be completed before the term when the described course is taken.

Private Study. Involves individual instruction with regular meetings; one-to-one demonstration, performance critique, music, fine arts or performing arts are examples.

Readings. A course where the instructor assigns readings and facilitates discussion at regular class meetings.

Registration. Enrollment at the beginning or prior to the beginning of a semester, including selection of classes and payment of fees and tuition.

Research. Research conducted that is independent of that done for a dissertation or thesis.

Sanction(s). The penalty for noncompliance to a policy. Usually a response that will redirect the individual or group's inappropriate behavior, encourage responsible judgment and ethical reasoning, protect the community's property and rights, and affirm the integrity of the institution's conduct standards.

Section. A division of a course for instruction. A course may be taught in one or more sections or classes or at different times, depending on enrollment in the course.

Second/Dependent Major. A second complete set of primary discipline-specific requirements in a discipline in which only a second or dependent major may be earned. A second major must be earned in a degree program in which the first major is one authorized to be given independently. Typically, a minimum of 30 hours is earned in each major area or discipline. Examples of second major areas are African and African American studies, Middle East studies, and Latin American and Latino Studies. An example of a degree with a second major is a Bachelor of Arts degree with a major in political science and a second major in Middle East studies. The second major is always listed second on the transcript.

Self-Paced (Correspondence). Course in which instruction is web-based and students are physically separated from the instructor. Interaction between instructor and student is not regular or substantive, and is primarily initiated by the student. These courses are self-paced and are not distance education. Students are not required to be admitted to the University of Arkansas to take a self-paced course.

Semester Credit Hour. Unit of measure of college work. One semester credit hour is normally equivalent to one hour of class work or from two to six hours of laboratory work per week for a semester.

Seminar. Involves a small group of students engaged in advanced study and original research under a member of the faculty and meeting regularly to exchange information and hold discussions; highly focused and topical course; may include student presentations and discussions of reports based on literature, practices, problems, or research.

Special Problems. Individualized investigation of topics or case studies in a specific field under the supervision of an instructor for the purpose of enhancing or illuminating the regular curriculum.

Special Topics. An organized course devoted to a particular issue in a specific field; course content is not necessarily included in the regular curriculum for the major.

State Minimum Core. See *University Core* below.

Student Number. A number given to each student as a permanent identification number for use at the university.

Studio Course. Involves the application of design and theory in a defined physical setting; students explore and experiment under the guidance of an instructor.

Summer Sessions. Periods of time during the summer when course work is offered. (Go to the Academic Calendar (<http://catalog.uark.edu/generalinfo/academiccalendar/>) for specific times and dates.)

Syllabus. An outline or summary of the main points of a course of study, lecture, or text.

Telecommunications. Course that utilizes technology in conveying teaching material. This only includes courses that use technology as the primary delivery method of course content, not courses that simply use technology to support another delivery method. These are distant education courses that generally: Uses one or more of the following technologies to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor, synchronously or asynchronously. The technologies used may include:

- The Internet;
- One-way and two-way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices;
- Audio-conferencing, etc.; or
- Videocassettes, DVDs, and CD-Roms, if the videocassettes, DVDs, or CD-Roms are used in conjunction with any of the technologies listed in the first three options

Thesis Research. See *Dissertation/Thesis Research* above.

Track. A subdivision of a concentration that a student must select and fulfill to complete the requirements of the concentration. Examples are the portfolio and thesis tracks within the specialist concentration in the Master of Arts in English degree. Tracks will print on the transcript.

Transcript. A **complete** record of the student's enrollment and academic history at the University of Arkansas, including **all** undergraduate, graduate, and law courses.

Tuition. The charge for university enrollment and registration, calculated per credit hour each semester. Tuition rates may vary depending on a student's resident status, undergraduate or graduate standing, and college affiliation. Tuition does not include cost of room and board. Additional charges will apply depending on student status. See the entry for Fees above.

UAConnect (<https://uaconnect.uark.edu/>). The online database that maintains student, faculty and staff records and class schedules.

Undeclared Major. Designation indicating students who have not selected a major.

Undergraduate Study. Work taken toward earning an associate or a baccalaureate degree.

University Core. The state of Arkansas specifies a number of core courses that students must successfully pass to obtain a degree. These are also sometimes referred to as the State Minimum Core. Find out more in the Requirements for Graduation (<http://catalog.uark.edu/undergraduatecatalog/academicregulations/requirementsforgraduation/>) and University Core (<http://catalog.uark.edu/undergraduatecatalog/>)

academicregulations/universitycore/) portions of the Academic Regulations section.

Withdrawal. Official withdrawal (<http://registrar.uark.edu/registration/withdrawal.php>) from all courses during a semester at the university.

¹ In establishing the official count of degrees awarded by the U of A, the Arkansas Department of Higher Education will count only one degree (major) for each student who completes a degree with double or combined majors. U of A staff may note in which major the degree is counted. Two degrees are counted only if the student completes two separate degree programs, a Master of Arts and a Master of Science, for instance.

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