

2004

## University of Arkansas Catalog of Studies, 2003-2004

University of Arkansas, Fayetteville

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UNIVERSITY OF ARKANSAS

# 2003 - 2004 Catalog of Studies

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## **Welcome to the University of Arkansas**

This catalog of studies is a comprehensive reference for your years of study - a list of courses and degrees offered at the University of Arkansas. In addition, it gives you valuable information such as suggested and required degree plans and information about costs, scholarships and financial assistance, campus resources and a student handbook. Read it with pleasure and with care.

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. If you are not sure where to find your academic adviser, contact the dean's office of your college; the phone numbers are listed on the page opposite this one. If your major is "undecided," contact the advising office in the J. William Fulbright College of Arts and Sciences at 575-3307; otherwise, call the dean's office in the college or school of your intended interest.

Remember, 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.

The University of Arkansas is committed to the policy of providing 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.

**Fayetteville, Arkansas**

Published one time each summer by University Relations and the Office of Academic Affairs.

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This catalog is available online at <http://pigtrail.uark.edu/catalogofstudies/>.

A limited number of copies may be available through the Office of Admissions, University of Arkansas, 200 Hunt Hall, Fayetteville, AR 72701.

Students who enter a college within the University of Arkansas in the academic year of this catalog generally may expect to follow the graduation requirements set forth by that college in this catalog. Because the faculty of each college reserve the right to change graduation requirements, students should meet with their college adviser regularly to be certain that they are aware of any changes in graduation requirements that may apply to them.

Acceptance of registration by the University of Arkansas and admission to any educational program of the University does not constitute a contract or warranty that the University will continue indefinitely to offer the program in which a student is enrolled. The University expressly reserves the right to change, phase out, or discontinue any program.

The listing of courses contained in any University bulletin, catalog, or schedule is by way of announcement only and shall not be regarded as an offer of contract. The University expressly reserves the right to 1) add or delete courses from its offerings, 2) change times or locations of courses or programs, 3) change academic calendars without notice, 4) cancel any course for insufficient registrations, or 5) revise or change rules, charges, fees, schedules, courses, requirements for degrees and any other policy or regulation affecting students, including, but not limited to, evaluation standards, whenever the same is considered to be in the best interests of the University of Arkansas.

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# 2003 Academic Calendar

## SUMMER SESSION I 2003 (29 CLASS DAYS)

May 12 - 20	Open Registration
May 19	Classes begin
May 20	Last day to register, add a course, or change from audit to credit
May 22	Last day to drop without a mark of "W" or change from credit to audit
May 26	Memorial Day Holiday
June 16	Last day to drop a Session I class
June 27	Last day to officially withdraw from Session I
June 27	Last day of classes for Session I

## SUMMER SESSION II 2003 (29 CLASS DAYS)

May 12 - July 1	Open Registration
June 30	Classes begin
July 1	Last day to register, add a course, or change from audit to credit
July 4	Independence Day Holiday
July 3	Last day to drop without a mark of "W" or change from credit to audit
July 28	Last day to drop a Session II class
August 8	Last day to officially withdraw from Session II
August 8	Last day of classes for Session II

## SUMMER SESSION III 2003 (58 CLASS DAYS)

May 12 - 22	Open Registration
May 19	Classes begin
May 22	Last day to register, add a course, or change from audit to credit
May 26	Memorial Day Holiday
May 29	Last day to drop without a mark of "W" or change from credit to audit
July 4	Independence Day Holiday
July 15	Last day to drop a Session III class
August 8	Last day to officially withdraw from Session III
August 8	Last day of classes for Session III

## SUMMER SESSION IV 2003 (49 CLASS DAYS)

May 12 - June 4	Open Registration
June 2	Classes begin
June 4	Last day to register, add a course, or change from audit to credit
June 10	Last day to drop without a mark of "W" or change from credit to audit
July 4	Independence Day Holiday
July 17	Last day to drop a Session IV class
August 8	Last day to officially withdraw from Session IV
August 8	Last day of classes for Session IV

## SUMMER SESSION V 2003 (24 CLASS DAYS)

May 12 - June 3	Open Registration
June 2	Classes begin
June 3	Last day to register, add a course, or change from audit to credit
June 4	Last day to drop without a mark of "W" or change from credit to audit
June 24	Last day to drop a Session V class
July 3	Last day to officially withdraw from Session V
July 3	Last day of classes for Session V
July 4	Independence Day Holiday

## SUMMER SESSION VI 2003 (25 CLASS DAYS)

May 12 - July 8	Open Registration
July 7	Classes begin
July 8	Last day to register, add a course, or change from audit to credit
July 9	Last day to drop without a mark of "W" or change from credit to audit
July 29	Last day to drop a Session VI class
August 8	Last day to officially withdraw from Session VI
August 8	Last day of classes for Session VI

## FALL 2003 (73 CLASS DAYS; 43 MWF, 30TT)

April 14 - Aug 13	Open Registration for currently enrolled students
August 20 - 29	Open Registration for all students
August 25	Classes begin
August 29	Last day to register, add a course, or change from audit to credit
September 1	Labor Day Holiday
September 8	Last day to drop without a mark of "W" or change from credit to audit
October 31	Last day to drop a fall semester class
November, Early	Priority Registration for Spring 2004 — dates not available at publication time
November 26	Fall Break (administrative offices will be open.)
November 27 - 28	Thanksgiving Holiday
December 9	Last day to officially withdraw from fall classes
December 9	Last day of classes for fall semester
December 10	Dead Day
December 11 - 17	Final Exams

The University's official five-year academic calendar is located on the World Wide Web at <http://www.uark.edu/classes/CalCover.html>.

# 2004 Academic Calendar

## SPRING 2004 (73 CLASS DAYS; 43MWF, 30TT)

January 7 - 16	Open Registration
January 12	Classes begin
January 16	Last day to register, add a course, or change from audit to credit
January 19	Martin Luther King Holiday
January 26	Last day to drop without a mark of "W" or change from credit to audit
March 15 - 19	Spring Break Week
March 26	Last day to drop a spring semester class
April 29	Last day to officially withdraw from all classes
April 29	Last day of classes
April 30	Dead Day
May 1 - 7	Final exams
May 8	All-University Commencement
May 15	Law School Commencement

## SUMMER SESSION I 2004 (29 CLASS DAYS)

May 17	Classes begin
May 31	Memorial Day Holiday
June 25	Last day of classes

## SUMMER SESSION II 2004 (29 CLASS DAYS)

June 28	Classes begin
July 5	Independence Day Holiday
August 6	Last day of classes

## SUMMER SESSION III 2004 (58 CLASS DAYS)

May 17	Classes begin
May 31	Memorial Day Holiday
July 5	Independence Day Holiday
August 6	Last day of classes

## SUMMER SESSION IV 2004 (49 CLASS DAYS)

June 1	Classes begin
July 5	Independence Day Holiday
August 6	Last day of classes

## SUMMER SESSION V 2004 (24 CLASS DAYS)

June 1	Classes begin
July 2	Last day of classes
July 5	Independence Day Holiday

## SUMMER SESSION VI 2004 (25 CLASS DAYS)

July 6	Classes begin
August 6	Last day of classes

## FALL 2004 (73 CLASS DAYS; 43 MWF, 30 TT)

August 26	Classes begin
September 6	Labor Day Holiday
November 24	Fall Break (administrative offices will be open.)
November 25 - 26	Thanksgiving Holiday
December 7	Last day of classes
December 8	Dead Day
December 9 - 15	Final exams

MAY 2003							JANUARY 2004									
S	M	T	W	T	F	S	S	M	T	W	T	F	S			
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11	12	13	14	15	16	17	11	12	13	14	15	16	17			
18	19	20	21	22	23	24	18	19	20	21	22	23	24			
25	26	27	28	29	30	31	25	26	27	28	29	30	31			
JUNE 2003							FEBRUARY 2004									
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1	2	3	4	5	6	7	1	2	3	4	5	6	7			
8	9	10	11	12	13	14	8	9	10	11	12	13	14			
15	16	17	18	19	20	21	15	16	17	18	19	20	21			
22	23	24	25	26	27	28	22	23	24	25	26	27	28			
29	30						29									
JULY 2003							MARCH 2004									
S	M	T	W	T	F	S	S	M	T	W	T	F	S			
		1	2	3	4	5			1	2	3	4	5	6		
6	7	8	9	10	11	12	7	8	9	10	11	12	13			
13	14	15	16	17	18	19	14	15	16	17	18	19	20			
20	21	22	23	24	25	26	21	22	23	24	25	26	27			
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AUGUST 2003							APRIL 2004									
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10	11	12	13	14	15	16	11	12	13	14	15	16	17			
17	18	19	20	21	22	23	18	19	20	21	22	23	24			
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31																
SEPTEMBER 2003							MAY 2004									
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7	8	9	10	11	12	13	9	10	11	12	13	14	15			
14	15	16	17	18	19	20	16	17	18	19	20	21	22			
21	22	23	24	25	26	27	23	24	25	26	27	28	29			
28	29	30					30	31								
OCTOBER 2003							JUNE 2004									
S	M	T	W	T	F	S	S	M	T	W	T	F	S			
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5	6	7	8	9	10	11	6	7	8	9	10	11	12			
12	13	14	15	16	17	18	13	14	15	16	17	18	19			
19	20	21	22	23	24	25	20	21	22	23	24	25	26			
26	27	28	29	30	31		27	28	29	30						
NOVEMBER 2003							JULY 2004									
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9	10	11	12	13	14	15	11	12	13	14	15	16	17			
16	17	18	19	20	21	22	18	19	20	21	22	23	24			
23	24	25	26	27	28	29	25	26	27	28	29	30	31			
30																
DECEMBER 2003							AUGUST 2004									
S	M	T	W	T	F	S	S	M	T	W	T	F	S			
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7	8	9	10	11	12	13	8	9	10	11	12	13	14			
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28	29	30	31													

# UNIVERSITY OF ARKANSAS

## Board of Trustees

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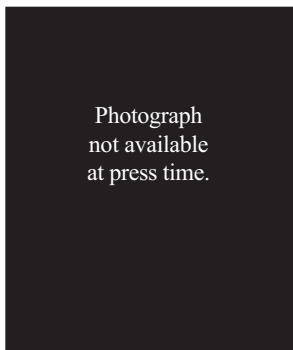
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Term Expires 2004



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*Vice Chairman*  
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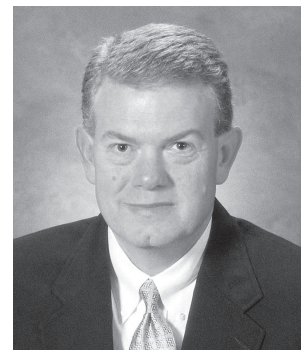
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**Tim E. Hunt**  
Paragould  
Term Expires 2010



**Jay Dickey**  
Pine Bluff  
Term Expires 2011



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Monticello  
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# Administrative Officers

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## SYSTEM ADMINISTRATION

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## CHANCELLOR AND VICE CHANCELLORS

Chancellor, University of Arkansas, Fayetteville	John A. White, B.S.I.E., M.S.I.E., Ph.D.
Provost and Vice Chancellor for Academic Affairs	Robert V. Smith, B.S., M.S., Ph.D.
Vice Chancellor for Finance and Administration	Donald O. Pederson, B.S., Ph.D.
Vice Chancellor for Government and Community Relations	Richard Hudson, B.A., M.A.
Vice Chancellor for Student Affairs	Johnetta Cross Brazzell, B.A., M.A., Ph.D.
Vice Chancellor for University Advancement	G. David Gearhart, B.A., J.D., Ed.D.

## DEANS

Honors College	Robert V. Smith, B.S., M.S., Ph.D. (Interim)
Dale Bumpers College of Agricultural, Food and Life Sciences	Gregory J. Weidemann, B.S., Ph.D.
School of Architecture	Graham F. Shannon, B.A., B.Arch., M.Arch.
J. William Fulbright College of Arts and Sciences	Donald R. Bobbitt, B.S., Ph.D. (Interim)
Sam M. Walton College of Business	Doyle Z. Williams, B.B.A., M.S., Ph.D.
Division of Continuing Education	Donnie Dutton, B.S., M.E., Ph.D.
College of Education and Health Professions	M. Reed Greenwood, B.S.E., M.Ed., Ed.D.
College of Engineering	Neil Schmidt, B.S.E.E., M.S.E.E. (Interim)
School of Law	Richard B. Atkinson, B.A., M.Div., J.D. (Interim)
Graduate School	Collis R. Geren, B.S., M.S., Ph.D.
University Libraries	Carolyn Henderson Allen, B.S., M.S.



# A Message from the Chancellor

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I invite you to share in our vision for the University of Arkansas as we work to emerge as a nationally competitive, student-centered research university serving Arkansas and the world. It's a vision that comes closer to realization with each passing year, thanks to an enormously talented faculty, bright and hard-working students, a dedicated staff, and a network of enthusiastic alumni and devoted friends across the state, nation and world. It's a vision that's contingent upon making rapid progress toward five institutional goals:

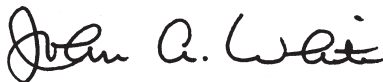
- Strengthening academic quality and reputation by enhancing and developing programs of excellence in teaching, research and outreach;
- Increasing the size and quality of our student body;
- Enhancing diversity among our faculty, students, and staff;
- Increasing public financial support, particularly that provided by the state and federal government;
- Increasing private gift support from alumni, friends, corporations, foundations and other organizations.

To be sure, the University of Arkansas already is one of the nation's great public research universities. It has a proud legacy of internationally significant scientific and intellectual achievements in many academic fields. It also enjoys a reputation of being a great teaching university and has produced over 120,567 graduates over its 132-year history who have provided leadership in their professions. In addition, the University creatively harnesses its intellectual capital to reach out to Arkansans and others through myriad outreach and public service programs, making life better for everyone.

The year 2002 marked a great inflection point in the University's history. Thanks to the generosity of the Walton Family Charitable Support Foundation, the University of Arkansas received a \$300 million gift — the largest in the history of American public higher education. We are using \$200 million to establish and endow what we believe will become the nation's finest undergraduate public honors college. The remaining \$100 million is being used to endow the University of Arkansas Graduate School. These two initiatives will fuel a rapid rise in academic quality and reputation, which in turn will allow us to fulfill our potential for serving as a powerful engine of economic development and cultural change.

I invite you to use this catalog of the University of Arkansas and become better acquainted with who we are and where we're going. On behalf of the University of Arkansas community, I also invite your support and involvement as we create a better future for the people we serve.

Sincerely,



John A. White  
Chancellor

# University Profile

The University of Arkansas, Fayetteville, serves as the major center of liberal and professional education and as the primary land-grant campus in the state. In addition, it is Arkansas' major source of theoretical and applied research and the provider of a wide range of public services to people throughout the state and nation. In serving its three-fold mission of teaching, research, and public service, the University strives to be recognized for excellence and continues to expand and strengthen its nationally and regionally competitive programs while maintaining a high level of competence in all programs.

The University offers a broad spectrum of academic programs leading to baccalaureate, master's, doctoral, and professional degrees, not only in traditional disciplines within arts, humanities, social sciences, and natural sciences, but also in the core professional areas of agricultural, food and life sciences; architecture; business; education; engineering; human environmental sciences; and law. Through its faculty and its student body, the campus seeks to have all of its programs regionally competitive and, in addition, to offer nationally competitive programs in selected areas.

The University of Arkansas offers 87 bachelor's degrees in 78 fields of study. In addition, the University offers a wide range of graduate degrees, including the Master's, the Educational Specialist, the Doctor of Education, and the Doctor of Philosophy. Information about graduate programs can be found in the *Graduate School Catalog* or on the World Wide Web at <http://www.uark.edu/depts/gradinfo>.

The University has statewide responsibility to provide research leadership in advancing the frontiers of knowledge. The research programs serve three primary purposes. First, as part of graduate instruction, research promotes students' abilities to appreciate and to implement, to discover, and to teach. Second, research programs serve as vital sources of information on the economic and social needs of Arkansas. Third, in selected areas, research on the Fayetteville campus serves a national and international scholarly community. The campus is committed to a future that includes sustained growth in its research and scholarship.

The University provides extensive technical and professional services to varied groups and individuals throughout the state, helping to further Arkansas' economic growth. In addition, the Fayetteville campus serves as a significant resource to the state. It operates nationally respected high school and college-level correspondence programs; it assists other institutions in developing educational programs; it offers graduate programs, both cooperatively and singly, throughout the state; and it makes specialized campus resources such as computing services and library resources available to other institutions in the state. The campus will continue to serve this unique role and may expand these services to continue providing statewide education through an uplink/downlink network as well as through additional cooperative graduate education programs.

## HISTORY

The University of Arkansas was established at Fayetteville in 1871. It opened its doors to students on January 22, 1872.

There were few facilities and practically no money for the beginning of that first academic year more than a century ago, but the new institution had a distinct advantage that has been of increasing importance throughout the years. It was established under provisions of the Morrill Act as both the State University and the Land-Grant College of Arkansas. This gave the new university an academic heritage from universities of the past and at the same time bestowed the educational responsibilities in "agriculture and mechanic arts" as envisioned by Senator Justin Smith Morrill of Vermont. The Morrill Act set aside federal land-grant money to help states in their efforts to establish programs of higher education.

The location of Fayetteville for the University was determined by elections held throughout the state for the purpose of voting bonds or subscriptions to establish the University. The largest bid came from the Washington County and the City of Fayetteville for a combined total of \$130,000. To this amount and the Congressional land grant of 150,000 acres, the state added an appropriation of \$50,000 for the benefit of the institution. The 160-acre homestead of William McIlroy was selected as the campus site and purchased for \$12,000. The McIlroy home was converted into classrooms, and a new, two-story, frame building was constructed with one classroom on each floor.

From a small beginning of eight students and three faculty members on the opening day of classes, the University of Arkansas has developed into a mature institution with eight schools and colleges. It is the major center in Arkansas for graduate-level instruction as well as basic and applied research. In addition, its public service activities reach every county in Arkansas and countries around the world.

## LOCATION

All units of the University of Arkansas, Fayetteville, except those indicated below, are located in Fayetteville, a community of more than 55,000 residents in Washington County, situated in the northwestern part of the state along the western and northern edges of the Ozark Mountains at an elevation of 1,400 feet. The surroundings are of great natural beauty, and the climate of the region is pleasant in all seasons.

The University of Arkansas Honors College provides exceptional opportunities for outstanding undergraduates to enhance their educational experiences and academic performances. The Honors College was created by a \$200 million dollar gift from the Walton Family Charitable Support Foundation with the goal that an honors education would be

available in every college, with the Honors College serving as an umbrella organization, providing coordination of honors efforts among the colleges and additional scholarship and service opportunities for participating students.

The academic units on the Fayetteville campus include eight colleges and schools: the Dale Bumpers College of Agricultural, Food and Life Sciences, the School of Architecture, the J. William Fulbright College of Arts and Sciences, the Sam M. Walton College of Business, the College of Education and Health Professions, the College of

Engineering, the School of Law, and the Graduate School.

The state office of the Cooperative Extension Service is located in Little Rock. The Division of Agriculture Arkansas Experiment Station operates the Main Station located in Fayetteville; research programs in the Division of Agriculture are also at the University of Arkansas, Pine Bluff; Arkansas State University; the department of forestry at the University of Arkansas, Monticello; four research and extension centers, and at 10 outlying stations.

# Undergraduate Fields of Study

The academic units of the University of Arkansas, Fayetteville, include eight colleges and schools and two military departments: the Dale Bumpers College of Agricultural, Food and Life Sciences, which includes the School of Human Environmental Sciences; the School of Architecture; the J. William Fulbright College of Arts and Sciences, which includes the School of Social Work; the Sam M. Walton College of Business; the College of Education and Health Professions, which includes the Eleanor Mann School of Nursing; the College of Engineering; the School of Law; the Graduate School, and the Departments of Army and Air Force ROTC. In addition, the Division of Continuing Education offers non-credit course work, correspondence courses for credit, and off-campus credit courses in cooperation with colleges and schools at Fayetteville.

The School of Law and the Graduate School offer professional and graduate degrees.

## **FIELDS OF STUDY BY COLLEGE AND SCHOOL**

Following is a list of fields of undergraduate study offered at the University of Arkansas, Fayetteville.

### **Dale Bumpers College of Agricultural, Food and Life Sciences**

Agricultural Economic and Agribusiness  
Agricultural Education, Communication and Technology  
Animal Science  
Biological Engineering  
(joint program with the College of Engineering)  
Crop Management  
Environmental, Soil, and Water Science  
Food Science  
Horticulture  
Pest Management  
Poultry Science  
Turf and Landscape Horticulture

### **School of Human Environmental Sciences**

Apparel Studies  
Foods, Human Nutrition and Hospitality  
General Human Environmental Sciences  
Human Development, Family Sciences, and Rural Sociology  
Interior Design

### **School of Architecture**

Architecture  
Architectural Studies  
Landscape Architecture

### **J. William Fulbright College of Arts and Sciences**

American Studies  
Anthropology  
Art  
Biology  
Chemistry  
Classical Studies  
Communication  
Computer Science  
Criminal Justice  
Drama  
Earth Science  
Economics  
English  
French  
Geography  
Geology  
German  
History  
International Relations  
Journalism  
Mathematics  
Medical Sciences  
Music  
Philosophy  
Physics  
Political Science  
Psychology  
Public Administration  
Sociology  
Spanish  
Second (or dependent) Majors\*  
African American Studies  
European Studies  
Latin American Studies  
Middle East Studies  
Russian Studies

### **School of Social Work**

\*A second (or dependent) major must be earned in a degree program in which the first major is one authorized to be given independently.

**Sam M. Walton College of Business**

Accounting  
 Business Economics  
 Finance  
 General Business  
 Information Systems  
 International Business  
 Management  
 Marketing  
 Transportation

**College of Education and Health Professions**

Communication Disorders  
 Elementary Education  
 Health Science  
 Kinesiology  
 Middle-Level Education  
 Recreation  
 Vocational Education

**Eleanor Mann School of Nursing****College of Engineering**

Biological Engineering  
 Chemical Engineering  
 Civil Engineering  
 Computer Engineering  
 Electrical Engineering  
 Industrial Engineering  
 Mechanical Engineering

**Undeclared Major**

Certain degree-seeking students who are temporarily undecided about their choice of a major field of study may select the undeclared major. However, all undergraduate students still must enroll in one of the colleges or schools. Each of these academic units makes provisions for undeclared majors and each has its own rules for the point at which a student must declare a major.

**PRE-PROFESSIONAL PROGRAMS****Pre-Law**

The University of Arkansas School of Law does not prescribe a specific pre-law curriculum and does not require any single "pre-law major." Instead, prospective students are encouraged to select baccalaureate majors best suited to individual interests and abilities. However, writing courses are often very valuable.

A baccalaureate degree is required for admission to the University of Arkansas School of Law, except for those students in the Dale Bumpers College of Agricultural, Food and Life Sciences or the Fulbright College of Arts and Sciences who are admitted to the special six-year program. All applicants for admission are required to take the Law School Admission Test.

**Other Pre-Professional Programs**

Fulbright College offers pre-professional programs and advisers in law, medicine, dentistry, optometry, medical technology, chiropractic, physical therapy, pharmacy, dental hygiene, occupational therapy, social work, and theology. The Dale Bumpers College of Agricultural, Food and Life Sciences coordinates the pre-veterinary medicine program.

**ACCREDITATIONS**

The University of Arkansas, Fayetteville, is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools, 30 North LaSalle Street, Suite 2400, Chicago, Illinois, 60602-2504. 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 Bachelor of Science in Human Environmental Sciences (B.S.H.E.S.) degree programs are accredited by the Council for Professional Development of the American Association of Family and Consumer Sciences. The degree program in dietetics is approved by the American Dietetics Association. The Bachelor of Interior Design (B.I.D.) degree is accredited by the Foundation for Interior Design Foundation Research (FIDER). The Nursery School and the Infant Development Center in the School of Human Environmental Sciences are accredited by the National Association for the Education of Young Children (NAEYC). The Bachelor of Science in Agricultural, Food and Life Sciences (B.S.A.) in food science is accredited by the Institute of Food Technologists. 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).

**School of Architecture**

The Bachelor of Architecture (B.Arch.) program is accredited by the National Architectural Accreditation Board, and the Bachelor of Landscape Architecture (B. Landscape Arch.) program is accredited by the Landscape Architectural Accreditation Board of the American Society of Landscape Architects.

**J. William Fulbright College of Arts and Sciences**

The Bachelor of Science (B.S.) degree program in chemistry is accredited by the American Chemical Society. The American Council on Education in Journalism and Mass Communications has accredited the Bachelor of Arts (B.A.) degree program in journalism. The degree programs in the Department of Music are accredited by the National Association of Schools of Music. The Doctor of Philosophy (Ph.D.) degree program in psychology is accredited by the American Psychological Association. The Bachelor of Arts (B.A.) degree program in social work 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 undergraduate students and 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 level. 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 M.A.T. program in middle school education is in compliance with the standards of the National Middle School Association. 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 M.S. degree program in speech pathology-audiology is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association. The Bachelor of Science in Nursing (B.S.N.) degree program is accredited by the National League for Nursing Accrediting Commission (61 Broadway Street, New York, NY 10006, (212) 363-5555, Ext. 153) and is approved by the Arkansas State Board of Nursing. The Bachelor of Science in Education (B.S.E.) degree program in health science, kinesiology, recreation, and dance is accredited by the Council on Accreditation of the National Recreation and Park Association. The M.S. degree in rehabilitation counseling is accredited by the Council on Rehabilitation Education.

### College of Engineering

Accreditation has been approved by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology for the following degree programs in the College of Engineering: Bachelor of Science in Biological Engineering (B.S.B.E.), Bachelor of Science in Chemical Engineering (B.S.Ch.E.), Bachelor of Science in Civil Engineering (B.S.C.E.), Bachelor of Science in Computer Systems Engineering (B.S.C.S.E.), Bachelor of Science in Electrical Engineering (B.S.E.E.), Bachelor of Science in Industrial Engineering (B.S.I.E.), and Bachelor of Science in Mechanical Engineering (B.S.M.E.), Master of Science in Transportation Engineering (M.S.T.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.

## SPECIAL PROGRAMS AND OPPORTUNITIES

### Honors Studies

Interested students should write to the Director of Honors Program in the appropriate college.

The **Bumpers College of Agricultural, Food and Life Sciences** Honors Program provides students with opportunities for intellectual enrichment beyond the traditional undergraduate experience. This is accomplished through special honors courses, completion of an undergraduate honors thesis and other significant activities including interactions with students in honors programs in other colleges. The results of the student's original research or creative project is published in *Discovery*, the college undergraduate research journal. In support of these efforts, participants in the Honors Program are eligible to receive an honors stipend in support of their research projects. The transcript and diploma of each honors graduate will designate the student as an honors graduate of the college. At the college commencement ceremony, each honors graduate will wear special regalia and have the title of their honors thesis and their mentor's names listed in the graduation program. Students must maintain a GPA of 3.25 to remain in the program. Students who do not participate in the program may also graduate with honors designation. For additional information, see the Bumpers College section of this catalog.

To create an intellectual environment that will challenge the best of students, the **J. William Fulbright College of Arts and Sciences** provides a comprehensive program of honor studies. From the first year to the senior year, an honors student is provided the opportunity to study

with other superior students in small distinctive classes taught by highly motivated and skilled faculty members. There are also opportunities for independent study so that students learn to work on their own and to develop their abilities and interests in ways that are not normally possible in regular college course work. Students participating in a program of honors studies also receive special academic counseling to satisfy their future career objectives. Students are offered every opportunity to achieve a high level of intellectual maturity and accomplishment. For additional information, see the Fulbright College section of this catalog.

The **Sam M. Walton College of Business** honors program is offered to high-achieving students interested in obtaining an outstanding business education at the University of Arkansas. Students who participate in the program will take honors classes in the University core as well as honors colloquiums in the Walton College offered exclusively to honors students. The subject matter of these colloquiums varies from year to year and focuses on current business issues. Students in the Walton Scholars Program will be offered a capstone course in the senior year involving actual consultation with an Arkansas business. Honors students will also complete a thesis in the senior year. Students in the honors program are entitled to register on the first day of registration week, have exclusive access to an honors computer lab/study area, and will be given priority consideration in such programs as the Arkansas Cooperative Education Program. For further information, see the Walton College section of this catalog.

The **College of Education and Health Professions** honors program is designed to enable undergraduate students who have demonstrated potential for outstanding scholarship achievement an opportunity to broaden and deepen their liberal and professional education. Honors students participate in honors seminars, leadership skills development and a required undergraduate thesis/project. Students are provided opportunities to enhance their learning experience through critical thinking, leadership skills development and independent study. For additional information, see the College of Education and Health Professions section of this catalog.

### Campus-Wide Academic Honor Societies

For other academic honor societies, see the various school and college sections of this catalog.

**Golden Key** is an academic honor society open to selected juniors and seniors who have a minimum 3.50 grade-point average (GPA).

**Order of Omega** honor society is exclusive to members of the Greek community on the University campus. Selection of members is based upon leadership in the inter-Greek activities, academic honors, and contributions to the University community. A 2.50 GPA is necessary for membership consideration.

**Phi Eta Sigma** is an academic honor society for freshman students. Membership is selected in the spring each year, and the only requirement is a 3.50 minimum GPA or better for the first semester of the freshman year.

**Phi Kappa Phi** is a national honor society whose primary objective is the recognition and encouragement of superior scholarship in all academic disciplines. Junior and senior undergraduate students who have a minimum GPA of 3.85 are eligible for membership. Also eligible are graduate students, registered for one year, who have a 3.85 minimum GPA.

**Tau Alpha Upsilon** is an honor society that honors outstanding students who live in the University of Arkansas Residence Hall system.

**Who's Who**, a general honor society, honors students who have excelled in scholarship, leadership, and campus activities throughout their college careers. Membership requirements are a 2.00 minimum cumulative GPA, completion of 85 credit hours, and at least two full semesters attendance at the University of Arkansas, Fayetteville, prior to application.

### Campus-Wide Leadership Honor Societies

**Blue Key** is a service-oriented honor fraternity that recognizes outstanding scholarship, leadership, and involvement in campus activities. Applicants must be classified as juniors and meet a 2.75 minimum GPA for membership consideration.

**Cardinal Key** is a junior service-oriented honor society whose membership selection is based on scholarship, leadership, and community and campus activities. A 3.00 GPA requirement must be met in order to be considered for membership at the end of the sophomore year.

**Cardinal XXX** is a service-oriented honor society whose membership consists of a select group of sophomores. Membership selection is based on scholarship, leadership, and community and campus service. A 3.00 GPA is required for consideration and selection is made at the end of the freshman year.

**Gamma Beta Phi** is a service-oriented honor society established to recognize and encourage excellence in education. Membership in the organization is open to students who are in the top 20% of their class.

**Mortar Board** is a senior honor society that considers outstanding scholarship, leadership, and service to the campus and community when selecting members. Applicants must have a 3.00 GPA in order to be eligible for consideration.

### Graduate and Professional Study

The University of Arkansas is the major center for comprehensive graduate-level instruction in the state, offering students the opportunity to continue their studies or to specialize in a particular field through the Graduate School. The University offers a wide range of graduate degrees, including the Master's, the Educational Specialist, the Doctor of Education, and the Doctor of Philosophy. **We also offer non-degree graduate certificates.** Information about graduate programs may be found in the *Graduate School Catalog* or on the World Wide Web at <<http://www.uark.edu/grad>>.

The School of Law on the Fayetteville campus offers a juris doctor degree program for qualified students with a bachelor's degree and offers the nation's only master's program in agricultural law for students with a law degree. Further information concerning professional study may be obtained by contacting the School of Law dean's office for a copy of the current catalog: University of Arkansas School of Law, Leflar Law Center, Waterman Hall 107, Fayetteville, AR 72701, (479) 575-3102. The World Wide Web address is <<http://law.uark.edu>>.

### Reserve Officers Training Corps

A true job training program, found in both the U. S. Air Force and the U. S. Army ROTC programs, provides a unique experience in the academic environment. In addition to the studies of Aerospace Education and Military Science, practical applications are provided in a realistic setting in which students interact with one another, studying the dynamics of leadership, management, ethics, communication and teamwork. Individuals are provided with the background and comprehensive building blocks to become commissioned officers in the U. S. military, if qualified. Physical activities and summer orientation programs are enhanced with continually updated curriculums. Course work is taught by military personnel, providing an up-to-date perspective on careers in the military.

In the finest traditions of the University of Arkansas and the ROTC programs, students are challenged to grow, develop, and assume responsibilities throughout their academic years. Underlying that teaching is a foundation of service, integrity and excellence — expected and demanded of all officer candidates. Scholarships and details of the two programs are found on page 193. Army ROTC is located in the Army ROTC building, (479) 575-4251 or toll-free 1-866-891-5538, <[www.uark.edu/armyhog](http://www.uark.edu/armyhog)>. Air Force ROTC is located in Memorial Hall, Room 319, (479) 575-3651, <[www.uark.edu/~afrotc](http://www.uark.edu/~afrotc)>.

### Cooperative Education Program

Cooperative Education is a unique program offered by the Office of Career Services that allows students to alternate between going to school and working in their chosen vocation. In addition, the program allows employers the opportunity to train and evaluate future employees before offering them positions.

Employment assignments are diversified to provide students with a variety of experiences related to their major field and with work of increasing difficulty and responsibility. Although the primary objective is to supplement theoretical knowledge with practical experience, students earn full-time pay while on work assignments. This benefit produces welcome income while the students are still pursuing a degree.

Positions are available to students in many disciplines, primarily engineering, architecture and landscape architecture, business, agriculture, natural science, and mathematics. Co-op students must be in good academic standing, must be at least 18 years of age, must be making normal progress toward a degree, and must meet the specific requirements of their college (for example: the College of Engineering and Dale Bumpers College of Agricultural, Food and Life Sciences require completion of the freshman year, Fulbright College of Arts and Sciences requires 45 credit hours (sophomore status), the Walton College of Business requires completion of pre-business program requirements, and the School of Architecture requires completion of the junior year. In addition, employers may establish their own academic criteria for selecting students.

For further information contact the Director, Cooperative Education, 411 Arkansas Union, telephone (501) 575-2550.

### Study Abroad

The University encourages the expansion of students' educational experiences through study abroad. Student exchange programs have been established with Kansai University and Shimane University (Japan), Hankuk University (Korea), Al-Akhawayn University (Morocco), University of Graz (Austria), University of Essex (England), University of Maine (France), and Carlos III University of Madrid (Spain). Other UA study abroad programs include summer/semester/year long programs in Austria, England, Scotland, Costa Rica, Ireland, France, Germany, Italy, Mexico, and Spain. A limited number of scholarships and travel grants are available each year for these programs.

For more information about study, work, and travel abroad, contact the Office of Study Abroad, a division of Fulbright College, 722 W. Maple, 575-7582. Students in the Bumpers College of Agricultural, Food and Life Sciences may contact International Agricultural Programs, HOTZ 307, 575-6727. Students in the Walton College of Business may contact the WCBA Advising Center, WCOB, 575-6308.



# Admission

## UNDERGRADUATE ADMISSION

Any person who intends to register for a course at the University of Arkansas must first be admitted to the University. Students returning to the University after an absence of a fall or spring semester must complete a short readmission form or may call the Office of Admission to reactivate registration privileges by phone.

The University reserves the right to modify admission requirements. Application forms and the most current information about admission requirements are available from the Office of Admission. Please send all application materials and supporting documents to the following address:

Office of Admission  
232 Silas H. Hunt Hall  
1 University of Arkansas  
Fayetteville, AR 72701  
Telephone: (479) 575-5346 or 1-800-377-8632

### When to Apply

A February 15 preferential application deadline applies to students wishing to enroll for the upcoming fall term; preferential application deadline for the spring term is November 1. Applications received after these deadlines will be considered on a space-available basis. We strongly encourage students wishing to be considered for any university scholarship to meet this preferential deadline. Completed applications received by these deadlines are guaranteed a decision on admission by April 1 for fall term and December 1 for spring term. Applications received after that time will be evaluated in as timely a manner as possible.

**Final deadlines for admission consideration:** Applications and required transcripts must be received in the Office of Admission by the following deadlines to be accepted for the respective enrollment periods:

Fall – August 15  
Spring – January 1

Students who are unable to submit their applications by the final deadline may be denied admission and considered for admission for the following term.

International students should refer to “Admission of International Students” for application deadlines, procedures, and requirements.

### How to Apply

1. **Submit a completed application for undergraduate admission and a \$30 non-refundable application fee to the Office of Admission.** This \$30 fee is not required of returning University students. You may apply for admission on the World Wide Web at <<http://www.uark.edu>>.
2. **Request that all required transcripts be sent to the Office of Admission.** Only officially signed transcripts, sent directly from the issuing institution and submitted in a sealed school

envelope, will be accepted for evaluation.

**High school transcripts are required of all entering freshmen, and transfer students with fewer than 24 transferable semester hours.** A preliminary admission will be provided to high school seniors on the basis of sixth- or seventh-semester transcripts. However, a final transcript showing all high school course work and certifying actual graduation must be submitted before a student may register for courses.

**College transcripts must be provided from each college or university attended.** To be considered official, transcripts must be sent directly from the issuing institution. Hand-carried transcripts are not considered official unless submitted in a sealed school envelope. However, students admitted after August 1 should bring personal, unofficial copies of their transcripts for use in advisement at the University.

3. **ACT or SAT scores no more than four years old are required for all new freshmen, and transfer students with fewer than 24 transferable hours.** Test scores should be sent directly to the University by the testing agency. The University’s institutional codes are: ACT-0144; SAT-6866.
4. **All students born after January 1, 1957, must return the immunization form enclosed with the offer of admission.** Immunization proof is required prior to first registration. A note to transfer students: We cannot accept proof of immunization from your previous institution.
5. **English Proficiency:** Applicants whose native language is not English must submit a Test of English as a Foreign Language (TOEFL) score of at least 550 (paper based), 213 (computer based), or a minimum score of 6.5 on the IELTS (writing) taken within the preceding two years. Students who have completed grades 10-12 at a U.S. accredited high school and have a satisfactory ACT English subscore may request a review for waiver of this requirement. For more information about the TOEFL, you may write to TOEFL Services, ETS, Box 899, Princeton, New Jersey 08541 or visit the World Wide Web at <<http://www.TOEFL.org>>.
6. **Disabled Students:** The University offers a variety of services to those students with physical or learning disabilities through our Center for Students with Disabilities (CSD). Students with any type of physical or learning disability are strongly encouraged to contact that office in Room 116 in the Arkansas Union, or call (479) 575-3104 (TDD/Voice) to learn more about the specific nature of their services and the overall accessibility of the University.

The University shall admit only those applicants whose enrollment will not be detrimental to the quality of life and the educational programs of the University. The Campus Faculty Committee on Admis-

sions and Transfer of Credit has sole authority to grant any individual a variance from any University admission or transfer policy if the committee deems it appropriate to do so after considering the individual's petition. Also, the committee has the final authority in interpreting University admission or transfer policies.

An applicant who has withheld pertinent information regarding educational background or who has falsified information or credentials may be denied admission to the University or, if enrolled, may be immediately withdrawn.

### **PREPARATORY CURRICULUM FOR ENTERING FRESHMEN, ACADEMIC YEAR 2003-2004**

Applications are reviewed on an individual basis with consideration given to the applicant's overall grade-point average (GPA), class rank, standardized test scores, and a personal essay. New freshmen and those transfer students with fewer than 24 transferable semester hours should have taken or be completing the following college preparatory curriculum in high school:

<b>English</b> .....	<b>4 units</b>
<b>Social Studies</b> .....	<b>3 units</b>
<b>Natural Sciences</b> .....	<b>3 units</b>
(Choose two courses from biology, chemistry, and physics laboratory. Two years of principles of technology will meet one unit of natural sciences [physics]. Two years of applied biology/chemistry will meet one unit of natural sciences [biology].)	
<b>Mathematics</b> .....	<b>3 units</b>
(Must be chosen from algebra I, geometry, algebra II, trigonometry, pre-calculus, and calculus. Two years of applied mathematics [I & II] may be substituted for one unit of high school algebra I.)	
<b>Electives</b> .....	<b>3 units</b>
(To be chosen from English, foreign languages, oral communication, mathematics, computer science, natural sciences, and social studies.) As you choose your electives, residents of Arkansas please remember that to be eligible for Arkansas Department of Higher Education scholarships (i.e. Governor's or Challenge) students must also have two (2) years of the same foreign language.	
<b>Total</b> .....	<b>16 units</b>

Students who have taken these course requirements and who have a high school GPA of at least a 3.0 and an ACT of 20 (or SAT of 930) or better will be admitted automatically. Those who do not may be admitted on the basis of individual review of their application materials. The admission decision will be based on evidence of ability to graduate from the University of Arkansas.

### **Accelerated Admission**

Superior high school students who have completed a rigorous college preparatory curriculum may seek admission to the freshman class at the end of their junior year of high school. Applicants for accelerated admission are required to complete certain required subjects during three years of high school study, to submit letters of recommendation, and to submit an ACT or SAT score equivalent to at least the 90th percentile of the University's previous entering class. Approval for accelerated admission is granted by the Faculty Committee on Admissions and Transfer of Credit. Additional information and application materials may be obtained by visiting or calling the Office of Admission.

### **ADMISSION OF TRANSFER STUDENTS**

#### **Transfer Admission Requirements**

Applicants who have attended other colleges or universities after

high school graduation are considered transfer students. The applicant must submit official transcripts of all previous college courses attempted whether or not credit was earned and regardless of whether the applicant wishes to transfer any credit. This transcript must be sent directly to the Office of Admission from each institution attended or be submitted in an official, sealed, school envelope. All transfer students must meet the following requirements:

1. have a cumulative grade-point average of at least 2.0 on all course work attempted, and
2. be in good standing (eligible to return) at the last institution attended. Grade-point average is calculated on all course work attempted, including courses that may have been repeated.

Students who have completed fewer than 24 transferable semester hours must, in addition to the above requirements, meet all requirements for freshman admission (see Admission of Entering Freshmen). Test scores and transcripts are also evaluated to determine whether State of Arkansas requirements for developmental course placement have been met. (See page 30.)

#### **Provisional Admission**

If a student is currently enrolled at another institution at the time the admission decision must be made, a provisional admission may be granted during the semester immediately prior to the student's registration at the University, provided the following requirements are satisfied:

1. at the time of application, the student must
  - a. present the most recent official transcripts (if any) from every college attended,
  - b. have an overall grade-point average of at least 2.0 on all college course work attempted, and
  - c. have maintained a grade-point average (if any) of at least 2.0 on the last semester of work.
2. prior to registering, the student must present final official transcripts from every college or university attended, demonstrating an overall grade-point average of at least 2.0 on all course work attempted.

**NOTE:** Transfer students entering in terms immediately following enrollment at another institution may, in special cases, make arrangements to register if a final transcript is not yet available from the previous institution. All other official documentation must be on file. In those cases, final official transcripts showing an overall grade-point average of at least 2.0 on all college course work attempted will be required within a specified time and prior to registering for a second term or semester at the University. Failure to demonstrate the required 2.0 average may result in an immediate administrative withdrawal.

International students should refer to the section on "Admission of International Students" for requirements.

#### **Arkansas Assessment of General Education (AAGE) or Rising Junior Exam**

All undergraduates in Arkansas public institutions who have earned at least 45 hours of credit toward a degree are required to take the Arkansas Assessment of General Education Exam (AAGE), also known as the Rising Junior Exam.

Students transferring from other Arkansas institutions who have earned 45 or more transferable semester hours must take the AAGE exam during the first semester of enrollment, unless the student has documentation that it was completed at another college or university in Arkansas. The only students who are exempt from the AAGE requirement are those transferring at least 61 degree credit hours from out-of-state or private institutions.

**Students who do not meet the AAGE requirement by the last day of their first semester will lose their future registration privileges.**

Testing services, 713 Hotz Hall, mails exam registration packets to a

student's local address. For more information on the AAGE, contact testing services at (479) 575-3948.

(See also "Advanced Composition" on page 43.)

### Transfer of Credit

The following policies control the granting of credit for course work taken at other institutions:

1. Transfer credits are subject to a two-stage evaluation process. First, the eligibility of the hours for transfer are evaluated by the Office of Admission. Credits found to be eligible for general transfer may not always count toward the minimum requirements for a degree at the University of Arkansas. The second step in the evaluation, performed by the academic dean's office or department responsible for the program of study, determines which hours evaluated will satisfy degree program requirements.
2. Grades earned at other institutions are not calculated in the student's grade-point average earned at the University.
3. General transfer credit is awarded for courses in which a grade of "C" or higher has been earned. Course work must be applicable to a baccalaureate degree; credit is not granted for course work that is remedial or technical in nature.
4. In the case of course work taken at institutions not fully accredited by a regional accrediting agency, transfer credit may be denied altogether or may be granted provisionally subject to successful completion of specified courses at the University. Normally, credit is provisionally granted only if the institution is a candidate for regional accreditation.
5. No more than 68 semester hours of lower-division (freshman or sophomore level) course work will be accepted. There is no limit placed upon the number of upper-division (junior or senior level) credit hours that may be awarded in general transfer, but a student must complete at least 30 hours in residence to meet graduation requirements (see Requirements for Graduation in this catalog). Please also refer to the appropriate college section of this catalog for any additional transfer policies that may be specific to your anticipated degree program.
6. The State Minimum Core (SMC). Act 98 of 1989 requires each institution of higher learning in Arkansas to identify a minimum core of general education courses that shall be fully transferable between state-supported institutions. Under guidelines from the State Board of Higher Education, the SMC consists of 35 hours distributed among the following education areas: English, U.S. history or government, mathematics, science, fine arts and humanities, and social sciences. Students transferring credit with grades of "C" or better from the approved SMC of another state-supported institution in Arkansas may expect to have all these hours applied toward their degree at the University of Arkansas. Each college at the University of Arkansas reserves the right to set additional general education or core requirements above and beyond those in a particular 35-hour SMC, however. The evaluation of transfer credit performed by the receiving college dean's office will determine the extent to which courses transferred as part of a SMC will satisfy degree requirements.

Students should be prepared to submit course descriptions of transfer work if there is any question concerning acceptance of credit toward a degree program. The University reserves the right to revise credit for advanced standing after the student has been in residence.

Please refer to the appropriate college or school section of this catalog for additional information concerning acceptance into specific degree programs.

### Arkansas Common Course Index System (ACCIS)

The University of Arkansas participates in the Arkansas Common Course Index System for the purpose of facilitating the transfer of general academic courses between higher education institutions in Arkansas. It is an index of the State Minimum Core courses that are common across all Arkansas institutions. The numbering of indexed courses does not reflect any other state's numbering system. ACCIS course numbers are noted in a footnote to the State Minimum Core courses on page 45. For more information you may contact the University of Arkansas Office of Admission or visit the ACCIS on the World Wide Web at <<http://www.gccc.cc.ar.us/arkacrao/main.htm>>.

### ADMISSION OF SPECIAL (NON-DEGREE SEEKING) STUDENTS

Applicants who are not interested in working toward a degree while taking classes, may, under certain conditions, be approved to do so upon submitting an application for admission. Degree-seeking students attending part-time or as an "undeclared major" should not confuse their status with this special, non-degree seeking category. The Office of Admission reserves the right to determine the proper category of admission and to determine what credentials may be required.

Classification as a special student permits enrollment in credit classes (or as an auditor) on a space-available basis; however, special students are not eligible for financial aid, and the University incurs no particular obligation to provide academic advisement.

Admission as a non-degree student is not intended to serve as a means of access to regular, degree-seeking status nor is it intended for a person who has earned unsatisfactory grades in previous high school or college course work. Students who have been denied regular undergraduate admission are not eligible for this status. Special students are subject to the same regulations concerning scholastic probation, suspension, and dismissal as other undergraduate students. Students who have previously been assessed developmental course requirements, high school course deficiencies, or a conditional admission will retain that status as a special student.

Special students must meet course prerequisites, and should be prepared to verify to the department by official documentation that University course prerequisites have been met, if appropriate. Students planning to enroll in any upper-division education courses should verify admission to the Teacher Education Program prior to registration. Special students may not enroll for more than nine hours of courses in a term without approval of the student's academic dean.

Unless otherwise specified, students with special status who wish to be admitted into a degree program at the University of Arkansas must apply for admission as such prior to the beginning of the term for which the change of status is requested. All requirements for admission to regular status must then be met. No more than 24 semester hours earned while in a non-degree seeking status will apply to a degree at the University.

#### When to Apply

Special students must meet the same application deadlines as other students with the exception of students participating in the senior citizens registration. For further information concerning registration, request a schedule of classes from the Office of Admission (available in October for the spring term and in March for the summer and fall terms).

#### How to Apply

The following students may be considered for special status:

1. Visiting students from other colleges or universities who wish to enroll at the University to earn credits that they plan to



transfer back to their home institution. It is the student's responsibility to verify with his or her college that courses taken here will be acceptable as transfer credit.

Application procedure: Submit a completed application, a non-refundable application fee, and a letter of good standing verifying eligibility to return to the home institution.

2. Students who want to take courses of special interest for personal or professional development, but who are not interested in working toward a degree. Applicants in this category are normally expected to have been out of high school for three or more years.

Application procedure: Submit a completed application and non-refundable application fee. Students who have been out of high school less than three years should submit a transcript verifying that admission requirements have been met.

The application fee is not required for students 60 years and older.

3. Students who already have a college degree and who want to take credit classes, but not toward another degree at this time. Credits earned under this classification will not count toward a graduate degree.

Application procedure: Submit a completed application and non-refundable application fee. Students who wish to enroll for successive terms should submit a transcript showing the degree.

4. Concurrent enrollment. Outstanding high school students who wish to take selected University courses while enrolled in high school may apply to the concurrent enrollment program. Applications are reviewed by the Faculty Committee on Admissions and Transfer of Credit. Requirements include a 3.50 grade-point average or above and ACT or SAT scores at the 80th percentile on national norms or above. Additional information and application materials are available from the Office of Admission.

**Application procedure:** Submit a completed application, a non-refundable application fee, ACT or SAT scores, high school transcript, letter of intent, and a letter of recommendation from the high school principal. Because applications require review by the committee on admissions, applications should be submitted at least one month in advance of the term and must be submitted by the application deadlines.

Concurrently enrolled high school seniors who plan to enroll in the fall as a regular freshman must submit a separate application for regular admission for the fall.

### READMISSION OF RETURNING UA STUDENTS

Any former student who wishes to return to the University after missing a fall or spring semester should call the Admissions Office to reactivate registration privileges. Students enrolled in UA correspondence courses during their absence must be readmitted. The \$30 application fee is not required for former students. (Any applicable late application fees, however, will be assessed.)

### When to Apply

An early readmission will enable you to register during priority telephone registration. You should submit your application and all appropriate credentials at least one month prior to the time you plan to register. For registration dates and procedures, you may view the schedule of classes on the Internet at <http://www.uark.edu/classes/soc.html> or request a copy from the Office of Admission (available in March for summer and fall terms and in October for spring term).

Application deadlines: Applications and required transcripts must be received in the Office of Admission by the following deadlines:

Fall – August 15

Spring – January 1

**If you miss the previously stated deadlines, your application will be considered for admission for the following term.**

### Requirements

1. Students must be academically eligible to return to the University, and are readmitted with the same academic status as held during their last attendance. Students on academic warning will be readmitted with the same probationary status. Course work taken at another institution will not affect your probationary status or UA grade-point average. Students with a probationary status are readmitted into the college of last enrollment. Permission to change colleges can only be granted by the college you wish to enter. Students who have not satisfied their initial provisions of admission (but are still eligible to return) will be required to satisfy those conditions upon their return.
2. Students with transfer work: Students who have attended another institution while away from the University will be considered transfer students, and must meet those requirements, including either a 2.0 grade-point average on all college work attempted and/or a 2.0 on all course work attempted since last UA attendance. Official transcripts of all course work attempted since last attendance at the University must be submitted (See Admission of Transfer Students).
3. Former special students: Students who previously attended the University as special students and wish to return as degree-seeking candidates must apply for admission as freshmen or transfer students, furnishing all appropriate admission credentials, including any required test scores. All requirements for admission to regular status must be met. (See appropriate section of this catalog for requirements.)
4. Former students who are submitting petitions to either the Academic Standards Committee or the Faculty Committee on Admissions and Transfer of Credit to request readmission must have on file all required documents with the Office of Admission by the application deadlines. (See the schedule of classes for deadlines for submitting petitions.)

### ADMISSION OF INTERNATIONAL STUDENTS

All international students must present officially certified academic credentials, evidence of adequate financial support, and, for non-native English speakers only, a minimum TOEFL score of 550 (paper based), 213 (computer based), or a minimum score of 6.5 on the IELTS taken within the preceding two years.

Applicants who meet the academic and financial requirements but who do not meet the English proficiency requirement of the University will be offered conditional admission and are required to attend an intensive English program through the Spring International Language Center. Students will be eligible to enroll in academic courses upon successful completion of the highest level of the intensive English program with a 3.0 grade average and recommendation of the director of Spring International.

An entering freshman who has completed secondary school at either U.S. or foreign institutions must have a) the equivalent of a final cumulative grade-point average of at least 2.75 and b) competency equivalent to that developed by taking four years of English and three years each of mathematics, natural sciences, and social studies, and an additional three units of electives chosen from English, speech, foreign languages, mathematics, natural sciences, or social studies in U.S. high schools.

A student transferring with fewer than 24 semester hours of post-secondary work at either U.S. or foreign institutions must (a) have a cumulative grade-point average of at least a 2.50 (or its equivalent) on all post-secondary work attempted, and (b) meet the requirements specified for entering freshmen. A student transferring from either a U.S. or

foreign post-secondary institution with at least 24 semester hours must have the equivalent of a cumulative grade-point average of at least 2.50 on all post-secondary course work attempted.

In addition to these requirements, all electrical engineering and computer systems engineering applicants must submit a Test of Spoken English (TSE) score of 5.0, or higher, and an ACT score of 25 [or SAT score of 1140(R)], or above, to be eligible for admission.

A non-refundable application fee of \$50.00 is required for all international applicants. All applications and supporting documents must be submitted by May 31 for the fall semester; October 31 for the spring semester; and March 1 for the summer sessions.

Any international student returning to the University after an absence of a full semester (fall or spring) or more must submit an application for admission. For these students, the application deadlines are August 15 for the fall term and January 1 for the spring term. It should be noted that a student previously enrolled at the University of Arkansas who takes a full term of courses elsewhere and then seeks readmission to the University returns as a transfer student and must meet University admission requirements for international transfer students, submit a photocopy of the I-20 issued by the transferring institution, and submit a new financial statement. An application fee is not required for returning students.

For specific admission requirements and application materials pertaining to students on F-1 or J-1 visas, applicants should write directly to the International Admission Office, 170 Dickson Street Annex, University of Arkansas, Fayetteville, Arkansas 72701, or call (479) 575-6246 or E-mail <uaiao@uark.edu>.

## ENGLISH LANGUAGE USE BY NON-NATIVE SPEAKERS

Non-native speakers of English admitted to undergraduate study at the University of Arkansas are required to present an acceptable score on one of the following tests: TOEFL (TWE), IELTS (writing), or ELPT (writing). Depending upon exam scores, a student may be required to take one or more EASL courses prior to the beginning of classes in their first term of study. Non-native speakers in the following categories are exempt from this requirement:

1. Undergraduate students who transfer at least 24 hours of credit from U.S. institutions, including courses that meet the freshman composition requirement;
2. Undergraduate students who attended at least three years and graduated from a high school in the United States and submitted an SATII/Writing score of 400 or an ACT English score of 19;
3. 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;
4. Graduate or undergraduate students with a Test of Written English (TWE) score of 5.0.

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 recommendations into English as a Second Language (EASL) support courses or course sequences. Courses are offered by the Department of Foreign Languages for those students whose language skills are diagnosed as insufficient for college-level work at the level to which they have been admitted (undergraduate or graduate study). Credit in EASL courses do not count toward University of Arkansas degrees. Non-native speakers diagnosed as having language competence sufficient for their level of study will not be recommended to enroll in EASL courses.

The ELPT is administered by Testing Services during New Student Orientation. Recommendations for EASL course work made as a result

of the ELPT will be advisory to students and their program advisers with undergraduates further advised to take the recommended courses before taking the required freshman composition courses and graduate students advised to take a writing course to support initial course work taken in their fields.

## ACADEMIC BANKRUPTCY

Students returning to the University after an absence of five or more years may be eligible to declare academic bankruptcy if they meet the following criteria:

1. Must have previously been enrolled at the University of Arkansas, Fayetteville, as an undergraduate student and be returning as an undergraduate student.
2. Must not have been enrolled at the University during the previous five years.
3. Students who have attended another institution since their last attendance at the University must meet requirements for transfer students (2.00 on all course work attempted more than five years after last enrollment at the University of Arkansas, Fayetteville) to be eligible for readmission
4. Must submit an application for readmission and official transcripts of all college work attempted since last attendance at the University of Arkansas by the application deadlines and submit a "Declaration of Academic Bankruptcy" form (available from the Office of Admission or academic dean's office). The following are the conditions of academic bankruptcy:
  - a. Students will forfeit all credit hours previously awarded by the University of Arkansas, Fayetteville. This includes course work completed at the University (regardless of grades earned), courses accepted in transfer, credit by examination, and any correspondence course work awarded.
  - b. A new calculation of grade-point average and credit hours will begin when the student returns to the University.
  - c. The transcript will reflect the student's complete record (including all previous college work) with an added notation of "Academic Bankruptcy Declared."
  - d. Courses taken at another institution within five years of the last UA enrollment will not be accepted in transfer. Course work completed more than five years after last UA enrollment may be accepted in transfer, subject to UA transfer credit policies. For purposes of this policy, UA correspondence course work will be treated in the same manner as transfer work.
  - e. For the University to provide appropriate advising and (as required by Arkansas Act 1052) appropriate assessment, a student may be required to submit ACT scores prior to registration for classes if, as a result of academic bankruptcy, that student is returning to the University as a freshman with fewer than 24 transfer hours.

## ADVANCED-STANDING PROGRAMS

### Credit by Examination

There are two ways a student enrolled at the University of Arkansas, Fayetteville, may establish undergraduate credit by examination in courses offered by the University: either through the University of Arkansas Credit by Examination Program (see the next section), or through approved national testing programs, such as the College Level Examination Program (CLEP), the Advanced Placement Program (AP), or the International Baccalaureate Program (IB). The faculty of each department is responsible for designating the courses in that department that may be challenged by examination.

Credit established by examination must be evaluated in terms of the specific program the student wishes to pursue. The decision regarding

the appropriate application of such credit to a degree program will be made in each college or school. Credit established by examination will be applied to a degree program in the same manner as credit established in any other way. If credit is earned by examination, the mark of CR will be entered in the student's record. Grades are not assigned.

In certain instances, however, instead of actually receiving credit in semester hours, a student may receive advanced standing and be authorized to enroll for advanced courses in the subject matter area.

Credit by examination may not be used to satisfy minimum residency requirements as established by each college or school. Credit by examination is recorded only for students currently enrolled at the University of Arkansas, Fayetteville.

### University of Arkansas Program

The following conditions apply to the departmental programs for credit by examination:

1. The student must make application for such examination on forms available in the office of the registrar or the academic dean. Permission to take the examination must be obtained from the faculty of the department offering the course.
2. The appropriate department or college offering the course will

designate and administer the examination.

3. A passing grade on the examination must be "B" or above. A second trial for credit by examination in that course will not be permitted.
4. A \$25 credit by examination fee will be assessed per course.

### National Testing Programs

When credit by a national examination is granted, the student's academic record will list the score used as a basis for credit as well as the type of examination used to establish credit, such as CLEP subject examination or general examination, AP examination or IB examination.

Credit is awarded on the basis of official score reports, which must be sent by the national testing service directly to the Office of Admission, 232 Silas H. Hunt Hall, University of Arkansas, Fayetteville, AR 72701. Credit may also be awarded on the basis of scores posted on an official university or college transcript, provided the type of examination is included. In all cases, minimum score requirements as established by the University of Arkansas, Fayetteville, must be met.

Approval has been granted to award credit for the following national testing programs.

### College Level Examination Program (CLEP), see page 21

CLEP Examination	UA Course	Minimum Score for Credit		Maximum Credit Allowed
		Paper-based test (pre July 2001)	Computer-based test (Effective July 2001)	
<b>General Examinations</b>				
College Mathematics	MATH 0003	520	<b>52</b>	3
English Composition <sup>1</sup>	ENGL 1013	490	<b>55</b>	3
	ENGL 1013 & ENGL 1023	540	<b>65</b>	6
<b>Approved Subject Examinations</b>				
American Government	PLSC 2003	47	<b>50</b>	3
American Literature	ENGL 3313	55	<b>58</b>	3
	ENGL 3313 & ENGL 3323	65	<b>68</b>	6
Biology	BIOL 1543/1541L	49	<b>50</b>	4
Calculus	MATH 2554	55	<b>60</b>	4
College Algebra	MATH 1203	50	<b>54</b>	3
College Algebra – Trigonometry	MATH 1285	55	<b>56</b>	5
English Literature	ENGL 2113	55	<b>57</b>	3
	ENGL 2113 & ENGL 2123	65	<b>66</b>	6
Freshman College Composition <sup>2</sup>	ENGL 1013	52 + acceptable essay	57 + acceptable essay	3
	ENGL 1013 & ENGL 1023	62 + acceptable essay	66 + acceptable essay	6
Chemistry	CHEM 1103/1101L & CHEM 1123/1121L	50	<b>55</b>	8
History of United States I	HIST 2003	50	<b>50</b>	3
History of United States II	HIST 2013	50	<b>50</b>	3
Human Growth & Development	HESC 1403		<b>63</b>	3
Information Systems & Computer Applications	ISYS 2232		<b>60</b>	2
Introduction to Educational Psychology	PSYC 4033		<b>55</b>	3
Introductory Psychology	PSYC 2003	47	<b>55</b>	3
Introductory Sociology	SOCI 2013	59	<b>59</b>	3
Principles of Accounting	ACCT 2013 & ACCT 2023	50	<b>54</b>	6
Principles of Macroeconomics	ECON 2013	48	<b>54</b>	3
Principles of Microeconomics	ECON 2023	48	<b>54</b>	3
Principles of Marketing	MKTT 3433	48	<b>50</b>	3
Trigonometry	MATH 1213	55	<b>55</b>	3
Western Civilization I	WCIV 1003	50	<b>60</b>	3
Western Civilization II	WCIV 1013	50	<b>60</b>	3

<sup>1</sup> The University accepts both the 90-minute multiple-choice test and the 90-minute test, which includes a 45-minute multiple-choice section and a 45-minute essay section.

<sup>2</sup> Essay required. Numerical scores by themselves will not suffice for credit, nor will they guarantee credit.



### College Level Examination Program (CLEP) – see page 20

The University of Arkansas is a CLEP testing center, and is authorized to administer CLEP examinations both on a national basis and on an institutional basis. However, CLEP examinations may be taken at scheduled times at any national test center, and the results sent to the University of Arkansas. The test center code number and score recipient code number for the University of Arkansas is 6866. For information or to make application, write Testing Services, 713 Hotz Hall, University of Arkansas, Fayetteville, AR 72701, Telephone (479) 575-3948.

Approval has been granted by appropriate academic departments to award credit in the following courses by the use of CLEP examinations. Minimum scores for the paper-based version and the new computer-based version were established by the departments of the subject areas concerned.

Visit us on the Web at <<http://www.uark.edu/admin/admiss/transfer/apclepib.htm>> for the minimum score for credit for CLEP examinations. Please note that minimum scores for credit for computer-based CLEP exams may differ from paper-based CLEP examinations.

### Advanced Placement Program (AP) – see courses on page 22

The Advanced Placement (AP) Program of the College Entrance Examination Board gives students the opportunity to pursue college-level studies while still in high school and, with an appropriate score on an AP exam, to receive advanced placement and/or credit upon entering the University. The AP examinations are offered annually by high schools that participate in this program. UA departments have authorized credit and/or placement for students who present qualifying scores in the AP courses listed on page 22.

### International Baccalaureate Program (IB)

The International Baccalaureate (IB) program is a comprehensive and rigorous two-year high school curriculum offered in the United States and in 72 countries around the world. The IB program provides students with a balanced education, facilitates geographic and cultural mobility, and promotes international understanding through a shared academic experience. The IB program gives students the opportunity to pursue college-level studies while in upper secondary school and to receive credit for final examinations upon entering the University.

The IB examinations are offered annually, usually in May, by high schools participating in this program. Students seeking credit for examinations must request that a final, official IB transcript of certificate or diploma results be sent by mail to the UA Office of Admission. These materials may be requested from International Baccalaureate North America, 200 Madison Avenue, Suite 2007, New York, NY 10016, Telephone: (212) 696-4464.

Approval has been granted by appropriate academic departments to award credit in the following courses. The minimum scores were established by the departments of the subject areas concerned.

International Course	International Baccalaureate (IB)	
	UA Course	Minimum Score
Chemistry	CHEM 1103/1101L & CHEM 1123/1121L	5 Higher Level
Economics	ECON 2013 & ECON 2023	5 Higher Level
English	ENGL 1013	5 Higher Level
	ENGL 1023	6 Higher Level
Geography	GEOG 1123	5 Subsidiary
Mathematics <sup>1</sup>		5 Higher Level
Philosophy	PHIL 2003	5 Higher Level
Physics	PHYS 2013/2011L	4 Higher Level
	PHYS 2033/2031L	

<sup>1</sup> May qualify for up to 8 hours of credit and/or placement in higher-level courses as determined by the Department of Mathematics.

### Placement and Proficiency Tests

The ACT measures proficiency in English, mathematics, reading, and science reasoning, and scores are used to determine placement in University courses. Students whose scores indicate the need for additional preparation may be placed in courses designed to prepare them for college-level work. (See Arkansas Requirements for Developmental Course Placement on page 30.) Credit earned in such courses does not count toward degrees in all colleges. (See Courses That Do Not Count Toward Degrees, page 30.)

**Freshman Composition Placement:** Students whose ACT score in English is 19 or below should enroll in the sequence of courses ENGL 0003, 1013, and 1023. Students whose ACT scores in English are between 20 and 27 should enroll in ENGL 1013-1023. Students with English ACT scores of 28 or above may enroll in honors English (1013H- 1023H) or regular English (1013-1023). Students with English ACT scores of 30 or above may take 1013H-1023H, or elect exemption. Students electing exemption must complete the appropriate forms available in the English departmental office. Some programs require credit in composition, and students should confer with their advisers before exempting.

**The Math Placement Test:** This test is offered during new student orientation and is required of new freshmen who have not presented ACT mathematics subscores and of transfer students who have not taken and passed a college-level Calculus I course. Students may opt to take the placement test to improve their placement in mathematics.

**Speech Communication Exemption Examination:** Students who have had speech in high school and/or experience in public speaking may elect to take this test for exemption from or credit in COMM 1313. Both the written and oral (a five-minute impromptu speech) examinations must be passed to receive exemption or credit.

**Foreign Language Placement Examinations:** Students with previous foreign language experience in French, German, or Spanish are encouraged to take language placement examinations offered during summer orientation. Those test scores will be used by academic advisers to determine an appropriate foreign language placement level. Students who omit one or more courses in the basic language sequence will receive credit for omitted courses when they have validated their high placement by passing the course into which they were placed with a “C” or better. Conversation courses (3033, 4033) and correspondence courses may not be used to validate such prior knowledge; and no degree credit (graduation credit) is awarded for a foreign language 1003 course to students in the J. William Fulbright College of Arts and Sciences continuing the language begun in high school, either by validation or regular registration.

**General Chemistry Placement Examinations:** These tests will be offered during orientation and at other times during the year. Students who performed at above average levels in high school chemistry may find it to their advantage to enroll directly in the second semester of general chemistry. This examination is designed to provide guidance in making this course selection. Students who place into the second semester of general chemistry and earn a grade of “C” or better in the course will also receive credit for the first semester of the course.

### GRADUATE SCHOOL ADMISSION

Applications for admission to the University of Arkansas Graduate School and two official copies of transcripts of the applicant’s academic record at each college and university attended since high school graduation must be submitted to the graduate school admissions office, 119 Ozark Hall, and approved in advance of registration. The transcripts will become a part of the student’s permanent file at the University. Applications may be obtained by writing to the graduate school admissions office, 119 Ozark Hall, University of Arkansas, Fayetteville, AR 72701, or by calling (479) 575-4401 or by applying on the World Wide Web at <<http://www.uark.edu>>.



Additional information and procedures for making application to the Graduate School are included in the *Graduate School Catalog*.

### Admission to Graduate Standing

To be admitted to graduate standing a student must have earned a baccalaureate degree from a regionally accredited U.S. institution or from an institution with substantially equivalent requirements for a baccalaureate degree, and must have an overall cumulative grade-point average of 2.70 or better on all courses undertaken prior to receiving the baccalaureate degree.

Admission to graduate standing does not admit a student to a specific program of study leading to a graduate degree. Therefore, in addition to satisfying the general requirements of the Graduate School, the applicant must also comply with the specific requirements and have the approval of the department in which graduate study is desired.

Under certain conditions, applicants for admission to the Graduate

School may be required to present satisfactory scores on the graduate record examinations (GRE) or another specified national standard test. For further details see the *Graduate School Catalog*.

### SCHOOL OF LAW ADMISSION

A baccalaureate degree is required for admission to the University of Arkansas School of Law, except for those students in the J. William Fulbright College of Arts and Sciences who are admitted to the special six-year program. All applicants for admission are required to take the law school admission test. (See page 113 for the Fulbright College Pre-Law Program).

For complete details concerning admission to the University of Arkansas School of Law, see the *School of Law Catalog* or write to Office of Admission, Robert A. Leflar Law Center, University of Arkansas, Fayetteville, AR 72701, telephone (479) 575-3102. Applications can be submitted on the World Wide Web at <<http://www.uark.edu>>.

### Advanced Placement Program (AP) – see page 21

Advanced Placement Examination	UA Course	Minimum Score for Placement and/or Credit
Art History	ARHS 1003	3C
	ARHS 2913	4C
	ARHS 2913 & ARHS 2923	5C
Biology	BIOL 1543H/1541M	3P
	BIOL 1543/1541L	4C
	BIOL 1543H/1541M	5C
Calculus AB	MATH 2554	3C
	MATH 2554H	5C
Calculus BC	MATH 2554 & MATH 2564	3C
	MATH 2554H & MATH 2564H	5C
	MATH 2554	4C
Chemistry	CHEM 1103/1101L & CHEM 1123/1121L	4C
	CHEM 1103/1101L & CHEM 1123H/1121M	5C
Computer Science A	CSCE 1023/CSCE 1021L	4C
	CSCE 1023H/1021M	5C
Computer Science AB	CSCE 1023/CSCE 1021L	3C
	CSCE 1023H/CSCE 1021M	5C
English Composition and Literature or English Language and Composition	ENGL 1013 (exempt)	3E
	ENGL 1013	4C
	ENGL 1013 & ENGL 1023	5C
Environmental Sciences	ENSC 1003	3C
European History	WCIV 1013	3C
French Language	FREN 1013	2Pq, 3C
	FREN 2003	4C <sup>3</sup>
	FREN 2013	5C <sup>3</sup>
French Literature	FREN 2013	2Pq
German Language	GERM 1013	2Pq, 3C
	GERM 2003	4C <sup>3</sup>
	GERM 2013	5C <sup>3</sup>
	PLSC 2013	3C
Government and Politics: Comparative Government and Politics: U.S.	PLSC 2003	3C
	PLSC 2003H	5C
	GEOG 1123	4C
Human Geography	LATN 1013	2 Pq, 3C
	LATN 2003	4C <sup>3</sup>
	LATN 2013	5C <sup>3</sup>
Latin: Literature	LATN 1013	2 Pq, 3C
	LATN 2003	4C <sup>3</sup>
	LATN 2013	5C <sup>3</sup>
Macroeconomics	ECON 2013	3Pq <sup>1</sup>
Microeconomics	ECON 2023	3Pq <sup>1</sup>

<b>Advanced Placement Program (AP), Continued</b>		
<b>Advanced Placement Examination</b>	<b>UA Course</b>	<b>Minimum Score for Placement and/or Credit</b>
Music Theory	MUTH 1603 & MUTH 1621	2P, 3Cq, 4C
	MUTH 1003	2Cq, 3C
	MUTH 1631 & MUTH 2603	4Cq, 5C
Physics B	PHYS 2013/2011L & PHYS 2033/2031L	3 Cq <sup>2</sup> , 4C
Physics C Mechanics	PHYS 2054	3 Cq <sup>2</sup> , 4C
Physics C, E & M	PHYS 2074	3 Cq <sup>2</sup> , 4C
Psychology	PSYC 2003	3C
	PSYC 2003H	5C
Spanish Language	SPAN 1013	2 Pq, 3C
	SPAN 2003	4C <sup>3</sup>
	SPAN 2013	5C <sup>3</sup>
Spanish Literature	SPAN 2013	2Pq
Statistics	STAT 2303	3C <sup>4</sup>
	STAT 2023	4C
Studio Art: Drawing	ARTS 1003	3C
	ARTS 1003H or ARTS 1013	5C
Studio Art: 2D Design	ARTS 1003	3C
	ARTS 1003H or ARTS 1313	5C
Studio Art: 3D Design	ARTS 1003	3C
	ARTS 1003H or ARTS 1323	5C
U.S. History	HIST 2003 or HIST 2013	3C
	HIST 2003 & HIST 2013	4C
World History	HIST 1123	4C
	HIST 1123H	5C

Symbols for placement and credit: P = placement; Pq = qualified placement (student may be placed in an advanced course, with credit awarded for prerequisite courses upon satisfactory completion, subject to departmental review.); C = credit; Cq = qualified credit (placement and credit subject to departmental review).

<sup>1</sup> Credit will be awarded upon satisfactory completion of a junior or senior-level economic course.

<sup>2</sup> Students must pass a departmental test to receive credit.

<sup>3</sup> To receive credit for courses preceding the course for which AP credit has been granted, students must enroll in and complete with a grade of "C" or higher, that course which follows in sequence the course for which AP credit was granted.

<sup>4</sup> At most, 3 hours credit allowed for AP Statistics.



# Financial Aid and Scholarships

## FINANCIAL AID

The University of Arkansas annually awards over \$90 million of financial aid and scholarships to students. Financial aid is divided into categories of grants, work, loans, and scholarships. Unless otherwise specified, a student needs to complete only two forms to apply for all four basic types of assistance: The Free Application for Federal Student Aid (FAFSA), which analyzes the ability of the student's family to pay for college; and the University's Application for Admission. These forms collect information used by the Office of Financial Aid and the University's scholarship committees in determining awards. In some cases, copies of the parents' and/or student's tax returns are needed.

### DETERMINING FINANCIAL NEED

To determine financial need a student needs to complete the FAFSA. Students release their information to the University of Arkansas by completing the college release section with the University of Arkansas Title IV Code of 001108.

There is a priority date of **MARCH 1** for the submission of the FAFSA for the approaching school year for new students. Federally funded financial aid will be awarded on the basis of need as reflected by the FAFSA.

The Student Aid Report from the FAFSA (consisting of several pages) will be sent directly to the student by the Central Processing Service. A student needs to be enrolled or accepted for enrollment before a financial aid award may be generated. To continue receiving financial aid, the student needs to be making satisfactory progress toward a degree, as defined by the University of Arkansas. (See Satisfactory Academic Progress, below.)

### APPLICATION PROCEDURE

1. Apply for admission to the University, if not currently enrolled or admitted.
2. Complete the Free Application for Federal Student Aid (FAFSA) and submit it to the federal processor by mail or online. You may submit the FAFSA on the Web at <http://www.fafsa.ed.gov>.

Students hoping to be considered for scholarships need to have their application for admission submitted by February 15 to the University for priority consideration. However, please check with your department for earlier deadlines and additional forms.

To receive priority consideration for financial aid, all forms and applications need to be submitted by March 1. Students are encouraged to apply even if they miss this priority date. Funds will be available after the priority date.

A student has a couple of choices concerning processing his or her FAFSA. These include mailing the form to the Federal Student Aid Programs or submitting it electronically on the Web at <http://www.fafsa.ed.gov>. The processing time for electronic applications is three weeks, and processing time for mailed applications is four to six weeks.

### SATISFACTORY ACADEMIC PROGRESS

Federal regulation requires that a student must be making satisfactory academic progress regardless of whether he or she has previously received Title IV aid. All students enrolled at the University of Arkansas who receive financial aid through the Title IV Assistance Programs must meet satisfactory academic progress requirements as defined below to be eligible for further aid. Satisfactory academic progress is deemed to have been made by any undergraduate student who meets both the quantitative and qualitative requirements indicated below.

#### **Quantitative Requirements**

There are two quantitative requirements that the student must meet to remain eligible to apply for financial assistance. First, the student must pass, at a minimum, 67% of the credits attempted while attending the University. Also, the student will remain eligible to apply for aid as long as the number of credits attempted is not more than 150% of the number of credits required for the student's degree.

A transfer student may have earned credits at another school that will count toward his or her degree at the University of Arkansas. Only transfer credits that apply to the student's degree will count as part of the 150% maximum.

The determination of each student's meeting the quantitative requirements for satisfactory academic progress will be made annually following the conclusion of the spring semester. If a student fails to pass at least 67% of the credits attempted or has attempted more than 150% of the number of credits required for graduation, then the student must appeal for reinstatement of financial aid eligibility.

#### **Qualitative Requirements**

A student is deemed to have met the qualitative requirements for satisfactory academic progress for financial aid purposes provided the student's academic status is not one of Academic Dismissal.

#### **Graduate and Law Students**

Satisfactory academic progress for graduate and law students is determined as described above with one exception. To meet the quantitative requirement, the student must pass with at least a grade of C, at a minimum, 67% of the credits attempted while attending the University at the graduate level.

## SCHOLARSHIPS

The Office of Academic Scholarships is part of the Honors College and is housed in Old Main, Room 518.

The University of Arkansas, Fayetteville, awards over 5,000 scholarships totaling more than \$14 million for students each year. This total does not include funds that support such external scholarships held by UA students as Governor's Scholarships or Arkansas Academic Challenge Scholarships. Scholarships funded by the University fall into three broad categories: distinguished fellowships, academic scholarships and special interest/skills scholarships.

### SCHOLARSHIPS FOR NEW STUDENTS

#### Distinguished Fellowships

The University of Arkansas offers four distinguished Fellowships. The Sturgis Fellowship (est. 1985), the Bodenhamer Fellowship (est. 1998), the Boyer Fellowship (est. 2000), and the Honors College Fellowships (est. 2002) are among the most competitive and prestigious fellowships in the nation and are awarded to the most competitive students in the country. Each Fellow receives up to \$50,000 for four years of study. Students who wish to apply should visit the Web site at [www.honorscollege.uark.edu](http://www.honorscollege.uark.edu). One application is used for all four Fellowships.

The Bodenhamer Foundation, acting through its trustee, Lee Bodenhamer (BSBA 1957, MBA 1961), established the **Bodenhamer Fellowships** to encourage Arkansas' brightest and best high school students to pursue any course of study that leads to a baccalaureate degree at the University of Arkansas. Students outside of Arkansas are also encouraged to apply. Ten Bodenhamer Fellowship offers are made to entering freshmen each year. Contact information: Gary Standridge, Director, Bodenhamer Fellowship Program, 479-575-3593, [cgs@uark.edu](mailto:cgs@uark.edu) or Kelly Carter, Director, Academic Scholarship Office, 479-575-4464, [bhamer@uark.edu](mailto:bhamer@uark.edu).

The **Boyer Fellowships** were established by Tommy (1964 BSBA) and Sylvia (1963 BSE) Boyer to assist an outstanding student from Arkansas who also demonstrates financial need and selects a major in the Sam M. Walton College of Business. One Boyer Fellowship offer is made to an entering freshman each year. Contact information: Karen Boston, Managing Director, Boyer Fellowship, 479-575-4622, [basucces@walton.uark.edu](mailto:basucces@walton.uark.edu).

The **Sturgis Fellowship** established by the Roy & Christine Charitable Trust Fund was created to attract students from the state and across the country who are interested in majoring in areas in the Fulbright College of Arts and Sciences. Ten Sturgis Fellowship offers are made to entering freshmen each year. Contact information: Sidney Burris, Director, Sturgis Fellowship, 479-575-2509, [sburris@uark.edu](mailto:sburris@uark.edu).

In 2002, The Walton Family Charitable Support Foundation established the **Honors College Fellowships** to assist in attracting outstanding students from Arkansas and the country. Honors College Fellowship applicants have a minimum of a 32 ACT or 1420 SAT or are National Merit Semi-Finalists and have a strong academic record. Up to 75 Honors College Fellowships offers are made to entering freshmen each year. Contact information: Suzanne McCray, Associate Dean, Honors College, 479-575-7678, [honors@uark.edu](mailto:honors@uark.edu).

#### Academic Scholarships

A limited number of academic scholarships also are awarded to entering freshmen and transfer students. Selection criteria include national test scores (ACT or SAT), grade-point average, National Merit or National Achievement recognition, quality and quantity of courses taken, and other pertinent factors.

**Academic scholarships** are either general University scholarships or

those awarded by a specific academic area (college, department, or program). The general scholarships are awarded to new students by the Office of Academic Scholarships in conjunction with the University Scholarship Review Committee. Scholarships that are more specific are awarded to upper-class students whose scholastic performance at the University serves as a criterion for the awards.

The **Honors College Academy Scholarships** (up to \$16,000 for four years) are awarded competitively to students in Arkansas from under-represented areas with a minimum of a 28 ACT and a 3.5 gpa. To apply for the Honors College Academy Scholarships we need only the admissions application. To view the admissions application, visit the following Web site: <http://admissions.uark.edu>.

**Special skill and interest scholarships** are awarded to new or continuing students on the basis of skills and performance in music (including band) and athletics, or on the basis of an interest in a military career (Army and Air Force scholarships).

Information about scholarship opportunities at the University is available from the Office of Academic Scholarships. Students may also obtain specific information about scholarship opportunities from the University departments that award them. The following listing of scholarship programs is provided to demonstrate the scope of scholarship opportunities at the University of Arkansas. Space in this catalog does not permit an all-inclusive listing.

See [www.scholarships.uark.edu](http://www.scholarships.uark.edu) for more information.

### UA SCHOLARSHIPS—GENERAL INFORMATION

The following regulations govern the general University scholarships described below:

1. **FEBRUARY 15** is the scholarship deadline for entering freshmen and **MARCH 15** for entering transfer students. An applicant must be admitted to the University by the above mentioned deadline to be considered for these scholarships.
2. An "entering freshman" is defined as a student who has not enrolled in another post-secondary institution in a fall or spring semester following graduation from high school.
3. Eligibility for renewal of Chancellor's and general University scholarships is determined at the end of the spring semester each "year." For this purpose, a "year" is defined as an academic year composed of summer sessions, fall semester, and spring semester, in this order. Students may "catch up" in summer terms by taking classes at their own expense on the Fayetteville campus.
4. These scholarships are generally awarded per academic year to cover the fall and spring terms, up to an eight-semester maximum. Renewal criteria are evaluated every two semesters. See <http://scholarships.uark.edu/renewal.html> for renewal schedules.
5. A student who is placed on academic warning forfeits his or her scholarship effective the semester of academic warning. See <http://www.uark.edu/admin/regrinfo/docs/academicstanding/ASpolicy.html> for a full description.

#### Chancellor's Scholarships

There are three levels of Chancellor's Scholarships, which are applied toward tuition, fees, and room and board (double occupancy) in designated residence halls. Greek House room and board allowances will begin with the freshmen class of Fall 2003. Chancellor's Scholarships are awarded on a competitive basis.

- The Chancellor's Merit Scholarship, for National Merit or Achievement finalists who designate the University of Arkansas as their first-choice institution to the Merit or Achievement organization;



- The Chancellor's Distinguished Governor's Scholarships, for Arkansas residents who apply and qualify for the Arkansas Distinguished Governor's Scholarship when funds are available from the State of Arkansas; and
- The Chancellor's Scholarship: Consideration will be given to students in the top 5% of the University's applicant pool and who have demonstrated outstanding leadership skills and examples of community service.

### Scholarships, Grants, and Other Awards for Non-Resident Students

See Appendix A.

#### Non-Resident Tuition Grant

The Non-Resident Tuition Grant is for entering freshmen from neighboring states with a 3.0 or higher GPA and a minimum 24 ACT/1090 SAT test score. This award will pay the out-of-state tuition differential. Neighboring states include Kansas, Louisiana, Missouri, Mississippi, Oklahoma, Tennessee, and Texas. Please contact the Office of Academic Scholarships at 479-575-4464 for more information.

### COLLEGE AND DEPARTMENTAL SCHOLARSHIPS

The following college and departmental scholarships are available to entering freshmen at the University of Arkansas. Complete addresses and phone numbers of the colleges, schools, or departments listed below may be found in the respective college or school sections of this catalog.

#### School of Architecture

Herbert Thomas Memorial Academic Scholarship is available to an entering freshman with outstanding high school records and ACT (or SAT) scores. This scholarship carries an annual stipend of \$1,750. It is renewable annually to the recipient who maintains a 3.00 cumulative grade point average in either the Bachelor of Architecture degree program or the Bachelor of Landscape Architecture degree program and makes satisfactory progress toward the degree. (Recipients must carry a minimum of fourteen hours of work each semester.) Upon graduation or forfeiture by the recipient, another scholarship is awarded.

Mary Pipkin Johnson Memorial Scholarship is available to a freshman entering the School of Architecture in the amount of \$2,250. This funding is based on high school performance and promise of professional ability. The scholarship continues as long as the recipient in the architecture or landscape architecture program maintains a 3.00 grade-point average. Upon graduation or forfeiture by the recipient, another scholarship is awarded.

Professional Advisory Board Freshman Scholarship. The recipient of this award is chosen by past academic success. He or she must show promise as a future professional in the fields of architecture or landscape architecture. It is open to any freshman entering the School of Architecture who is interested in either architecture or landscape architecture in the amount of \$1,000.

#### J. William Fulbright College of Arts and Sciences

The J. William Fulbright College of Arts and Sciences offers many outstanding scholarship opportunities. Collectively, Fulbright's 19 departments offer more than 100 scholarships and awards. At the college level, 12 scholarships benefit students in the arts and sciences. For comprehensive information about these awards, visit the Web at <http://www.uark.edu/~arsc/students/scholarships.html> or call 575-4801.

Three college-wide scholarships merit special attention: Through the Sturgis Fellowship Program, Fulbright College offers premier scholarships worth \$50,000 over four years to exceptionally talented students

with the intellectual potential to become future leaders in society. In addition, all honors students are eligible to apply for research and study abroad funding through the Sturgis Grants Program. For information or an application, contact Director of Honors Studies at 575-2509.

The King Fahd Center for Middle East and Islamic Studies offers substantial four-year and two-year renewable scholarships to superior students majoring in Middle East Studies. The program also offers competitive funding for language study in Morocco, Tunisia, and Egypt. Funding for summer study abroad and research projects is considered on a case-by-case basis. Scholarship applications and information about the program can be obtained by contacting [mest@uark.edu](mailto:mest@uark.edu) or calling 575-4157.

In honor of the Fulbright commitment to international education, the College offers the J.W. and Elizabeth W. Fulbright Endowed Scholarship, which supports a year of study abroad. To qualify, students must display an interest in one of the following fields: literature, history (including theatre, art, and music history), jurisprudence, philosophy, archaeology, comparative languages, and those aspects of the social sciences that employ philosophical or historical approaches. For more information about these opportunities, visit <http://www.uark.edu/~arsc/students/scholarships.html> or call 575-4801.

#### Dale Bumpers College of Agricultural, Food and Life Sciences

A Margaret Stearns Fellowship in the amount of \$9000 will be awarded annually to an incoming freshman that has achieved outstanding academic performance, and is renewable up to three years.

Beginning with the 2003-2004 academic year, Division of Agriculture Land Grant Scholars Endowment Program shall provide up to 16 scholarships, dependent upon the availability of funds: the goal is to award one graduate fellowship at \$11,000; two undergraduate scholarships \$8000 each, one to an entering freshman and the other to a new transfer student; thirteen undergraduate scholarships for \$4000 to three entering freshman and to ten new transfer students.

Dale Bumpers Distinguished Scholar Program provides one \$2500 scholarship to the outstanding transfer undergraduate and a \$1000 award to the outstanding graduate student.

Information and application procedures regarding these and approximately 200 departmental scholarships are available on the college Web site: <http://www.uark.edu/depts/dbcafls/scholarships.html>.

#### Sam M. Walton College of Business

The Boyer Fellowship is offered to Walton College students who have achieved at an outstanding level both in and out of the classroom. High grades and standardized test scores are required along with a strong commitment to service and the demonstration of exceptional leadership skills. Applicants for the Boyer Fellowship must demonstrate financial need.

Other scholarships are available through the departments of accounting, information systems, economics, finance, management, and marketing & logistics as well as through the Walton College's general scholarship program. Scholarships are primarily awarded on the basis of academic achievement and/or financial need.

For further information on Walton College scholarships, contact the Undergraduate Programs Office at 575-4622.

#### College of Education and Health Professions

The College of Education and Health Professions offers a limited number of scholarships at various amounts. Applicants are selected on the basis of promise, character, leadership skills, scholarship, and financial need.

Scholarship applications are available in December of each year. We

strongly encourage all current and future COEHP students to take advantage of these scholarship opportunities.

For further information regarding scholarship opportunities within the College, visit the Web at <<http://www.uark.edu/depts/coehp/Scholarships.htm>> or contact the Boyer Center for Student Services, 8 Peabody Hall, 575-4205.

### College of Engineering

The College of Engineering awards numerous scholarships and fellowships to entering freshmen, continuing students, transfer students, and graduate students. Most scholarships are based, primarily, on academic performance. However, scholarships are also awarded on the basis of financial need and minority status. Scholarships are available from both the College and its individual departments.

College scholarships are available to any engineering student while departmental scholarships are meant for students enrolled in a particular discipline of engineering. Students must be admitted to the University of Arkansas and accepted into the College of Engineering to qualify and receive either a College or Departmental scholarship.

The College has a one-step application process that allows a student to be considered for all college level scholarships. Departmental scholarship applications can be obtained from the respective department offices.

For more information concerning scholarship opportunities, contact the College of Engineering Scholarship Officer at 479-575-4092 or e-mail [scholarship@engr.uark.edu](mailto:scholarship@engr.uark.edu). Questions regarding minority programs should be directed to the Minority Programs Director at 479-575-6012.

## SPECIAL SCHOLARSHIPS AND CONDITIONS

### ACT 1185

Arkansas income taxpayers and their dependents who reside in a bordering state in a county or parish contiguous to an Arkansas county in which a public institution of higher education is located may enroll at the University of Arkansas and receive an out-of-state tuition award under the provisions of ACT 1185 of 1995, Section 34. The availability of funds may vary each year, and the students must provide certain documentation. Please contact the Office of Academic Scholarships at 575-4464 for more information.

### Arkansas Alumni Association Scholarships

The Arkansas Alumni Association awards two four-year Arkansas Alumni Association Scholarships per academic year to high school seniors planning to attend the University of Arkansas. Selection is based on academic achievement, demonstrated leadership, and applicant's essay as well as extra-curricular activities, community involvement, and work experience.

- The License plate or "Roads" Scholarship recipients are automatically considered from applicants for the Arkansas Alumni Scholarship. Candidates are selected from various regions across the state, therefore the recipients must be Arkansas residents. The number of scholarships awarded depends on funds made available by the sale of the Razorback Collegiate License Plates.
- Arkansas Alumni Chapter Scholarships are funded by participating alumni chapters across the country to encourage high school seniors from their geographical areas to attend the University of Arkansas. Recipients are considered from applicants for the Arkansas Alumni Scholarship.

**FEBRUARY 15** is the application deadline for scholarships.

### Alumni Legacy Scholarships

The Alumni Legacy Scholarship will pay the out-of-state tuition differential. Non-Resident students with a 3.0 high school GPA and 24-36 ACT/1110-1600 SAT are eligible if they have a parent with a degree from the University of Arkansas-Fayetteville, who is a current member of the Arkansas Alumni Association. Please contact the Arkansas Alumni Association at 575-2801 for more information.

### Alumni Legacy Tuition Reduction Grant

The Alumni Legacy Tuition Reduction Grant will pay 50% of the out-of-state tuition differential. Non-Resident students who are admitted, and have a parent with a degree from the University of Arkansas-Fayetteville, and are a current member of the Arkansas Alumni Association are eligible. Please contact the Arkansas Alumni Association at 575-2801 for more information.

Selection criteria includes national test scores (ACT or SAT) and grade-point average.

### Music and Band

The music department offers scholarships for talented students who sing or play instruments. Band scholarships are given for participation in the UA Band Program and are based on playing ability, academic achievement, and potential contribution to the University of Arkansas Bands. Both awards are renewable for up to five years (ten semesters), as long as the student meets the conditions specified on the scholarship contract.

Music and Band Scholarships are available to music majors and to students majoring in other areas who participate in certain ensembles. All scholarships require an audition. To set up an audition, contact the music department at 479-575-4701 or the band office at 479-575-4100.

### Air Force and Army ROTC

The Air Force and Army Reserve Officer Training Corps programs offer a number of scholarship opportunities for entering freshmen and on-campus students. See the Reserve Officer Training Corps section of this catalog for detailed information.

### Veterans 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: 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 Bill for Selective Reserves.

Students must be working toward a degree and following the curriculum outline for their objectives, since only specific courses may be applied toward VA certification and graduation. Students eligible for educational benefits may contact the Office of the Registrar for further information.

Detailed information regarding stipends and housing is provided in the chapter "Reserve Officer Training Corps."



# Orientation and Registration

All new undergraduate students, both freshmen and transfer students, are expected to attend an orientation session preceding their enrollment. The orientation program is designed to introduce every aspect of the university community to our students in a manner in which they will establish a bond with the institution and those here to support them. A significant aspect of this experience will be to provide students with information about the policies, support systems, and resources of the University, while engaging them with their advisers in the appropriate academic programs. To this end, students should complete the orientation program prepared to register for classes and ready to embark upon their academic careers. Students who attend the orientation program register during that time.

## REGISTRATION

Undergraduate students, including students not declaring a major, must enroll in one of six academic units: the J. William Fulbright College of Arts and Sciences; the Dale Bumpers College of Agricultural, Food and Life Sciences; Sam M. Walton College of Business, the College of Education and Health Professions, the College of Engineering or the School of Architecture. Information regarding registration periods and procedures is included on the Registrar Web site at [www.uark.edu/classes](http://www.uark.edu/classes).

### Registration Periods

Students must register during one of the formal registration periods. Currently enrolled students are expected to register during the priority registration held each semester for the following semester. For additional registration periods check the the Registrar Web site at [www.uark.edu/classes](http://www.uark.edu/classes). New students (freshmen and transfers) are expected to register during the registration held in conjunction with orientation. New students, who have not already registered during orientation should register during the three-day registration session that immediately precedes the beginning of classes each semester. There is a late registration period of five days at the beginning of fall and spring semesters and a one- or two-day late registration period at the beginning of the summer sessions, but students may find that many classes are filled.

### Proper Address of Students

It is the responsibility of all students to maintain and correct their addresses with the University and to report any change of address promptly to the office of the registrar. Failure to do so may result in undelivered registration notices, invoices, invitations, and other official correspondence and announcements. Students may update address information at the Registrar Web site.

### Identification Cards

Identification cards are made by the Division of Student Affairs during each registration period and at scheduled times and places during the year. Several privileges on campus require an I.D. card and it can be used as a debit card for purchases at various locations throughout the campus. Part-time students are also eligible for a card.

### Academic Advising

Academic advising is a process, ideally one of continuity and commitment, which involves both students and faculty. In addition to helping students plan course schedules, advisers use the medium of a curriculum to facilitate the intellectual, ethical, personal, cultural and social development of college students. Advisers help students explore academic options and personal goals and the relationship of these to the practical world of work. ***Advisers are accountable for the information and advice they provide.***

All students may count on their faculty advisers to do the following:

- Disperse correct information regarding academic rules and regulations, University and college requirements, and course requirements in the student's selected major.
- Understand admission requirements and the relationship of ACT scores to placement in remedial or honors courses.
- Provide extended office hours during registration periods so students receive the information and guidance to complete the course selection process.
- Keep thorough records to chart academic progress toward graduation and to maintain the continuity of the advising process.
- Be able to relate the student's academic major to areas of future employment.
- Be sensitive to the diversity of students being advised and knowledgeable of campus tutoring and support services available to them.
- Be aware of current developmental theory as it pertains to college students so that student/adviser communication is based in reality.
- Be a resource and student advocate in the sometimes intimidating world of academia.

The University is committed to developing each student to his or her fullest potential. To this end, programs in each college have been established to improve the academic achievement and persistence of students on academic warning and other students in need of academic assistance. Such assistance is provided through a variety of instructional and informational services.

## Arkansas State Requirements for Developmental Course Placement

Arkansas law specifies that all first-time entering freshmen enrolled in a bachelor's degree program will be placed in either college-level credit courses in English and mathematics or remedial courses in English composition, reading, and mathematics on the basis of their scores on specified tests.

- Students who score below 19 on the English section of the ACT or below 470 on the verbal score of the SAT must enroll in Remedial English 0003, which does not carry degree credit.
- Students who score below 19 on the reading section of the ACT or below 470 on the verbal score of the SAT must enroll in Developmental Reading 0003, which does not carry degree credit.
- Students who score below 19 on the mathematics section of the ACT or below 460 on the quantitative portion of the SAT must enroll in Remedial Math 0003, which does not carry degree credit. However, students whose Mathematics Placement Test (MPT) scores qualify them for placement in a higher-level mathematics course, such as MATH 1203, may enroll in that course. Students will be required to register for these courses during their first term at the University and, if necessary, in subsequent terms until passing grades have been earned in all required courses. Students must successfully complete any required developmental course in English before degree credit for freshman English can be awarded; students must successfully complete any required developmental course in mathematics before enrolling in a college-level mathematics course. Students who need further information or clarification regarding this law are encouraged to discuss this with their academic adviser or dean.

## Courses That Do Not Count Toward A Degree

The following courses do not count toward degree credit in any college or school: ANTH 0003, PHSC 0003, ENGL 0003, MATH 0003, and RDNG 0003.

The following courses do not count toward any degree in the College of Engineering: MATH 1203 (College Algebra), MATH 1213 (Plane Trigonometry), MATH 1285 (Pre-calculus Mathematics), and ENGL 2003 (Intermediate Composition).

## Registration for Grades of Pass-Fail

Students in some programs may register to take certain courses on a pass-fail basis. In such cases, a mark of "CR" (passed) or a grade of "F" (failed) will be recorded.

Students in the J. William Fulbright College of Arts and Sciences, the School of Architecture, and the Dale Bumpers College of Agricultural, Food & Life Sciences are eligible to enroll for certain courses on a pass-fail basis under the following conditions:

1. That such registration be approved by the student's adviser. (Students in Agricultural, Food & Life Sciences must also have the approval of their academic dean.)
2. That the student has attained sophomore rank, or higher.
3. That the student is not on academic probation, and has achieved a cumulative grade-point average of at least 2.00.
4. That such enrollment be limited to one course per semester.
5. That the total enrollment on a pass-fail basis be limited to no more than 18 hours in any student's degree program.
6. That the courses involved are not part of the student's major and are not specifically required as part of the student's degree program.
7. Normally, registration for pass-fail credit will be completed prior to the final date for changing registration by adding a course.

Grades for students enrolled on a pass-fail basis will be reported on final grade rosters in the usual manner. The dean's office will review each report and will authorize the registrar to record "CR" or "F" on the student's official academic record, as appropriate. The "CR" marks will not be counted in grade point averages but will increment hours earned; the "F" grade will be counted in the grade point average.

College of Education and Health Professions students may enroll in courses on a pass-fail basis under the same conditions but only in courses offered by the Fulbright College of Arts and Sciences and the College of Education and Health Professions. Walton College of Business and College of Engineering students may not take courses on a pass-fail basis.

## Undeclared Major

Degree-seeking students who are undecided about their choice of a major field of study will be considered to have an undeclared major. However, all undergraduate students must enroll in one of the colleges or schools. Each of these academic units makes provisions for undeclared majors and each has its own rules concerning the point at which a student must declare a major. Again, your academic adviser will be of great assistance in determining the college or school in which a student with an undeclared major should enroll.

Walton College of Business students have the pre-business classification with an intended major until they complete specific lower-division courses, a process that normally takes four semesters. Students entering the College of Engineering must declare an intended major. All engineering students are classified pre-engineering students until they have satisfied the pre-professional program, which is normally completed during the freshman year.

## Registration for Audit

Students wishing to audit a class should contact the instructor teaching that class and request permission to audit. If the instructor approves the audit, the academic department will register the student in that class as an audit. Auditing of a class is allowed on a space-available basis, and a student must pay fees for that 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 may be awarded is "AU."

## 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 a 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 Office Web site 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 below.

A student may drop a course during the first 10 class days of the 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 listed in the schedule of classes.

### Withdrawal from Registration

Withdrawing from the University 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 complete an exit interview and then drop all classes on the student registration system or notify the Office of the Registrar in writing. Withdrawal may occur anytime during the semester through the last day of classes. Withdrawal deadlines for summer sessions are listed in the summer schedule of classes; summer withdrawals do not require an exit interview. Students who do not withdraw officially from a class they fail to complete will receive an "F" in that class. Students with holds on their registration should contact the Office of the Registrar for assistance in processing their official withdrawal from the University.

The deadline for a full fee adjustment for an official withdrawal is the day before the start of classes for that term. After that date a \$45.00 withdrawal fee will be charged and a percentage of the fees will be refunded. Refer to the the Treasurer's Office Web site for the deadlines and percentages.

### Student Standing

Definitions of undergraduate student classification are as follows:

- Freshman – a student who has passed fewer than 30 semester hours of course work
- Sophomore – a student who has passed more than 29 semester hours and fewer than 60 semester hours
- Junior – a student who has passed more than 59 semester hours and fewer than 90 semester hours
- Senior – a student who has passed 90 or more semester hours

### Course Loads

While University offices and services typically recognize the full-time status of students who have enrolled for a minimum of 12 semester hours, students should bear in mind that this minimum number of hours is insufficient to allow them to complete a four-year degree program in eight academic semesters (four years). Since most University degree programs require a minimum of 124 semester hours, or 31 hours per year, a student should earn 15 to 16 hours per semester to complete most degree programs in four years (eight semesters).

#### Number of Hours Allowed Per Semester

1. Students who wish to carry more than 17 hours per semester must first obtain the permission of their academic advisers.
2. Students who wish to carry more than 18 hours per semester must first obtain the permission of their academic dean(s).
3. Students who wish to carry more than 21 hours per semester must first request and receive favorable action from the Academic Standards Committee.
4. Students on academic warning may not carry more than 12 hours per semester.
5. Students on academic suspension who choose the limited enrollment option may not carry more than 9 hours for that semester.
6. Students who wish to exceed the normal summer school load must have the approval of their academic dean(s) to take seven hours in five- or six-week sessions or 13 to 14 hours in 10- or 12-week sessions. Students who wish to take more than seven hours in one five- or six-week session or more than 14 hours in one 10- or 12-week session must first receive favorable action from the Academic Standards Committee.
7. For disabled students, less than 12 hours may be certified as full-time with the approval of the appropriate dean and the concurrence of a physician or a licensed examiner.



The fee and tuition estimates stated in this chapter were effective for the fiscal year beginning July 1, 2002. The numbers for the fiscal year beginning July 1, 2003, were not available at press time. Visit the Web at the following address, where the most current information will be posted as soon as it is available: <http://advancement.uark.edu/catalogofstudies/>

# Fee and Cost Estimates for 2002-03

Educational expenses will vary according to a student's course of study, personal needs, and place of residence. All fees, charges, and costs quoted in this catalog are subject to change without notice.

Financial obligations to the University must be satisfied by the established deadlines. Payment may be made at the University Cashier's Office in the lobby of Silas H. Hunt Hall by cash, personal check, money order, certified check, or VISA, MasterCard, or Discover credit cards. Payment may also be made via the World Wide Web at <<https://www2.uark.edu/servlet/edu.uark.trea.getAccountBalance>>.

Acceptance of payment for fees does not imply academic acceptance to the University.

## ESTIMATED NECESSARY EXPENSES PER SEMESTER

Estimates of necessary expenses for one semester of the 2002-2003 academic year for a typical undergraduate student taking 14 credit hours per semester at the University of Arkansas:

	Undergraduate Resident	Undergraduate Non-Resident
Tuition	\$1,667.40 (\$119.10/hr)	\$4,641.00 (\$331.50/hr)
University Fees <sup>1</sup>	305.48	305.48
COLG Fee <sup>2</sup>	199.47	199.47
<b>SUBTOTAL</b>	<b>\$2,172.35</b>	<b>\$5,145.95</b>
Room and Board <sup>3</sup>	\$2,412.00	\$2,412.00
<b>TOTAL</b>	<b>\$4,584.35</b>	<b>\$7,557.95</b>

Other variable costs per year

Books, supplies, and lab fees \$ 500 to 1,500  
Personal expenses and travel \$1,500 to 2,500

When paying tuition, room and board, and associated fees, anticipated financial aid for a current semester may be deducted when adequate documentation is provided to the University Cashier's Office in Silas H. Hunt Hall. Adequate documentation includes, but is not limited to, award notices, guarantee notices, scholarship letters, and promissory notes.

The latest information regarding costs and other aspects of University life may be obtained by calling or writing the Office of Admissions, 200 Hunt Hall, University of Arkansas, Fayetteville, AR 72701. In Arkansas call 1-800-377-8632; from outside of Arkansas call (479) 575-5346.

## TUITION FEES

Students classified as "in-state" for fee payment purposes are assessed tuition fees. Students classified as "out-of-state" for fee payment purposes are assessed additional tuition fees.

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 in Appendix A of this catalog. Out-of-state students who question their residency classification are encouraged to contact the Office of Admissions, 200 Silas H. Hunt Hall, for more information about residency classification review procedures.

### Academic Year

Undergraduate students are assessed tuition fees of \$119.10 per credit hour. Students with out-of-state residency status are assessed additional tuition fees of \$212.40 per credit hour.

### Summer Sessions

Undergraduate students are assessed tuition fees of \$119.10 per credit hour. Undergraduate students with out-of-state residency status are assessed additional tuition fees of \$212.40 per credit hour.

1 University fees include the following:

Arkansas Assessment of General Education fee ----- \$4.76  
Health, physical education and recreation fee (HPER) ----- 45.92

and the following student-initiated and student-approved fees:

Student Activity fee (ACTY) ----- 9.80  
Student Health fee, calculated at \$6.00 per credit hour (HLTH) ---- 84.00  
Associated Student Government fee ----- 8.96  
Media fee (MEDA) ----- 8.54  
Arkansas Union fee, calculated at \$2.35/credit hour (ARKU) ----- 32.90  
Fine Arts Activity fee ----- 3.78  
Technology fee, fees are calculated at \$2/credit hour (TECH) ----- 28.00  
Transit fee (TRST) ----- 25.06  
Network Infrastructure and Data Systems Fee  
calculated at \$3.21/credit hour (NETW) ----- 44.94  
Safe Ride Fee ----- 2.52  
Distinguished Lecture Fee ----- 6.30

2 Teaching Equipment and Laboratory Enhancement (COLG) fee.

The COLG fee is an averaged fee weighted by enrollment and by college. The fee provides and maintains state-of-the-art classroom and laboratory equipment.

3 Average expenses for living in a residence hall, double occupancy, with an unlimited meal plan. Actual room and board fees vary from \$2,314 to \$2,510 per semester.



## **ARKANSAS ASSESSMENT OF GENERAL EDUCATION FEE**

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This is a Board of Trustees approved fee supporting the assessment requirements mandated by Act 874 of the General Assembly in the 1993 Regular Session.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, undergraduate students are assessed \$ .34 per credit hour.

## **HEALTH, PHYSICAL EDUCATION AND RECREATION FEE**

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This is a Board of Trustees mandated fee supporting various physical education activities including intramural programs. Students are allowed access to gyms, the pool, fitness center, sauna, racquetball courts, and the indoor track.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed \$3.28 per credit hour.

## **STUDENT ACTIVITY FEE**

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### **University Programs**

University Programs are funded by the student activity fee. Students are admitted free to numerous programs presented throughout the year, except major, promoted concerts.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed \$ .70 per credit hour for the student activity fee.

## **STUDENT HEALTH FEE**

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The student health fee covers the cost of office visits by physicians, registered nurses, and other health professionals, medical evaluations, women's health visits, and counseling and psychological service visits. Other services covered by the health fee include health promotion and education and 24-hour emergency care for counseling and psychological needs.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed \$6.00 per credit hour.

## **ASSOCIATED STUDENT GOVERNMENT FEE**

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### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed \$ .64 per credit hour. These funds are allocated to registered student organizations.

## **MEDIA FEE**

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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.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed \$ .61 per credit hour.

## **ARKANSAS UNION FEE**

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The Arkansas Union fills the role of the community center of the campus. This fee supports the renovation, expansion and partial operational costs of the Union.

### **All Academic Semesters**

During the regular fall, spring, and summer academic semesters, students are assessed a fee of \$2.35 per credit hour.

## **FINE ARTS ACTIVITY FEE**

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This fee supports cultural events free of charge, or with minimal charge, to students. These events include presentations in music, theater, drama, opera, visual arts, creative writing (poetry and fiction), and public speaking. Most of the events are held on campus or at the Walton Arts Center. The fee makes cultural presentations possible and encourages students to take advantage of activities. Fulbright College allocates the proceeds of the fee to support cultural programming.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed \$ .27 per credit hour.

## **TECHNOLOGY FEE**

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This fee provides improvements in computer access for students: increasing dial-up ports, network access, lab support, training programs and improvements in computing facilities.

### **All Academic Semesters**

During the regular fall, spring, and summer academic semesters, students are assessed a fee of \$2.00 per credit hour.

## **TRANSIT FEE**

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The transit fee helps fund the Razorback Bus Transit System, which services the campus and neighboring community year round.

### **All Academic Semesters**

During the regular fall, spring, and summer academic semesters, students are assessed \$1.79 per credit hour.

## **NETWORK INFRASTRUCTURE AND DATA SYSTEMS FEE**

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The 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. It also provides support for upgrades and replacement of the student information system.

### **All Academic Semesters**

During the regular fall, spring and summer academic semesters, students are assessed a fee of \$3.21 per credit hour.

**SAFE RIDE FEE**

The Associated Student Government has initiated a fee that generates necessary funds for the Safe Ride Program, which is a safety-oriented program available during the fall and spring semesters. The program provides a free ride home (within Fayetteville city limits) from any Fayetteville location to all UA students 10 p.m. to 2:30 a.m. Thursday through Saturday.

**All Academic Semesters**

During the regular fall, spring, and summer academic semesters, students are assessed \$ .18 per credit hour for the safe-ride program fee.

**DISTINGUISHED LECTURE FEE**

The Distinguished Lecture fee specifically pays for two speakers, one in the spring semester and one in the fall semester. Speakers represent two groups: 1) Arts and Entertainment Industry and 2) World Leader or Newsmaker. One speaker from each group is invited each year. Speakers are chosen by the Distinguished Lectures Committee, which is represented by students, staff and faculty. Contact ASG for information on how to become a member of the Committee. The lectures or presentations are free to students via the fee.

**All Academic Semesters**

During the regular fall, spring, and summer academic semesters, students are assessed \$ .45 per credit hour for the distinguished lecture fee.

**TEACHING EQUIPMENT AND LABORATORY ENHANCEMENT 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, Bumpers College of -----	\$ 6.45
Architecture, School of -----	12.82
Arts and Sciences, Fulbright College of -----	7.62
Business, Walton College of -----	12.97
Education and Health Professions -----	6.45
Engineering -----	20.18

**SPECIAL COURSE AND PROGRAM FEES**

## Architecture Urban Design Studio fee:

ARCH 1015, 1025 -----	\$68.00 per credit hour
ARCH 2016, 2026, 3016, 3026 4016, 4026 ---	56.70 per credit hour

## Landscape Architecture Off-Campus fee:

LARC 1315, 1325, 2336, 2346, 3356, 3366, 4376 -----	\$68.00 per credit hour
LARC 3914 -----	85.00 per credit hour

## College of Education and Health Professions' fees:

PEAC 1481 -----	\$5.00 per hour
PEAC 1811 -----	25.00 per hour
PEAC 1821 -----	25.00 per hour
PEAC 1831 -----	130.00 per credit hour

RECR 1001 -----	10.00 per credit hour
RECR 1023 -----	3.40 per credit hour

## Communication Disorders

CDIS 548V Clinical Practicum -----	\$50.00 per semester
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## Internship for Communication Disorders:

CDIS 578V Public School Site -----	\$100.00 per semester
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Graduate Internship (M.A.T.): -----	200.00
(Education majors only)	

Special Education Practicum -----	25.00
(CIED 532V)	

## Intern in Education Administration

EDAD 574V, 674V -----	40.00
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## College of Agricultural, Food and Life Sciences

## Infant Development Center and Nursery School Fee:

HESC 2402 and 2401L, HESC 3402 and 3401L -----	\$15.00 per credit hour
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## Interior Design Fee:

HESC 1034/1031L, 1044/1041L, 2803, 2813, 3803, 3813, 4803, 4863 -----	\$15.00 per credit hour
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**OTHER FEES**

Graduation fee for baccalaureate degree .....	25.00
I.D. Card fee	
First card .....	20.00
Each replacement card .....	15.00
Installment Payment Plan Fee .....	25.00
International student (nonimmigrant) application fee .....	50.00
International student service fee	
Per semester .....	45.00
Late payment fee:	
On the fifth day of classes, if payment has not be paid .....	25.00
December 1, April 15, and July 31 for fall, spring and summer, if payment has not been made .....	50.00
Mandatory international student health insurance per year .....	623.00
New student orientation fee .....	70.00
Parking Permit (per vehicle)	
Off campus .....	34.00
On campus .....	50.00
Renewal of Graduation Status Fee .....	5.00
Residence Hall application fee for new students .....	15.00
Returned Check Fee .....	26.00
Study Abroad Service Fee .....	\$10.00 per credit hour
Transcript Fee	
Official Copy .....	5.00
Unofficial Copy .....	2.00
Undergraduate application for admission fee .....	\$ 30.00
Undergraduate late application for admission fee .....	55.00
Withdrawal from the University fee: .....	\$45.00

**Testing Fees**

All student testing fees will be based upon the actual cost of the test to be administered plus a standard handling charge not to exceed \$15.00 to be added to the University's cost for each individual test administered.



## FEE ADJUSTMENTS

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### Academic Year

Students who officially withdraw (dropping ALL classes that have not been completed up to that time) from the University of Arkansas during the regular fall or spring semesters receive a cancellation of fees as follows, less an Administrative Withdrawal fee of \$45.00:

- 100% adjustment of tuition and fees before the first day of the semester
- 90% adjustment of tuition and fees through the first 10% of days in the semester
- 80% adjustment of tuition and fees through the second 10% of days in the semester
- 70% adjustment of tuition and fees through the third 10% of days in the semester
- 60% adjustment of tuition and fees through the fourth 10% of days in the semester
- 50% adjustment of tuition and fees through the fifth 10% of days in the semester
- 40% adjustment of tuition and fees through the sixth 10% of days in the semester

### Summer Sessions

Students who officially withdraw from a summer session or who drop classes in the summer receive a cancellation of fees as follows:

- 100% adjustment of tuition and fees before the first day of the session
- 90% adjustment of tuition and fees through the first 10% of days in the session
- 80% adjustment of tuition and fees through the second 10% of days in the session
- 70% adjustment of tuition and fees through the third 10% of days in the session
- 60% adjustment of tuition and fees through the fourth 10% of days in the session
- 50% adjustment of tuition and fees through the fifth 10% of days in the session
- 40% adjustment of tuition and fees through the sixth 10% of days in the session

### Billing Statements

Students who pre-register for a semester will be mailed an invoice approximately three weeks prior to the first day of classes. Invoices will be mailed to the student's permanent address unless a separate billing address has been filed with the Treasurer's Office.

It is the responsibility of the student to ensure a correct billing address on the Student Information System. The late fee will not be waived because an invoice was not received.

### Late Fees

Students who register for the fall 2002 and spring 2003 semesters are required to pay all registration-related fees and housing charges by the posted payment deadline. Students who fail to pay all registration fees and housing charges or execute an installment payment plan by the deadline may be assessed a late payment fee equal to the outstanding balance, not to exceed \$25.00.

Any student with an outstanding balance, to include registration-related fees and/or housing charges, at the end of a semester will be assessed a late payment fee equal to the outstanding balance, not to exceed \$50.00.

## Disbursement of Refund Checks

Disbursement of refund checks due to overpayments by scholarships, loans, and/or grants will be mailed approximately one week prior to the start of classes. Checks will be mailed to the student's permanent address unless a check address has been established with the student accounts office.

### Addresses

Students may create a billing address, which will be used specifically for billing statements, and a check address, which will be used specifically for overpayment checks. These addresses may be created in addition to the local and permanent addresses. If a billing or check address is not created, the default address will be the permanent address. The student may pick up an address form in the Student Accounts Office, Hunt Hall 101 or change their address at the following website: <<http://www.uark.edu/admin/reginfo/records/Addresses.html>>.

## WAIVER OF TUITION AND FEES FOR SENIOR CITIZENS

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Students who are 60 years of age or older and show proper proof of age may have tuition and fees waived. This waiver is limited to credit courses. Admission and enrollment under these conditions is open only on a "space available" basis in existing classes. Enrollment during Priority Registration periods is not allowed.

## ROOM AND BOARD

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### University Housing

(Rates are subject to change)

Single freshmen under 21 years of age are required to live in University residence halls, fraternity or sorority houses, or with their parents, unless permission to live off-campus has been obtained through University Housing. Permission to reside off-campus is granted on a semester basis and must be obtained prior to enrolling or prior to the semester in which off-campus residency is desired.

Costs of room and board in University residence halls for one semester during the 2002-03 academic year range from \$2,314 to \$2,510 for double occupancy rooms and with an unlimited meal plan. Single rooms are an additional \$450 per semester and are available on a first-come, first-serve basis. There is an additional \$25 activity fee for residence hall tenants.

Housing for married students, students with family status, nontraditional, graduate, and law students is limited and requires early application. Carlson Terrace, two-bedroom, unfurnished units with utilities paid cost \$336 per month. Terrace Manor, one-bedroom, furnished units with utilities paid cost \$395 per month (phone & cable not included).

Summer rates for room and board in University residence halls with unlimited meal plans during summer sessions are \$19.89 per day for double-occupancy room and \$24.19 per day for a single. Charges start on the requested move-in day and run through the date of check-out.

Specific questions concerning on-campus living may be directed to University Housing (479) 575-3951. Specific questions concerning sorority and fraternity living may be directed to the Office of Greek Affairs (479) 575-5001.

### Off-Campus Housing

Students eligible to live off-campus may contact local real estate offices for rental information and availability.

**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 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 University Housing, Attention: Assistant Director for Business, Hotz Hall, 9<sup>th</sup> 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 205 Administration Building, Attention: Treasurer, (479) 575-5651.

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 ranging from \$34 to \$151 for each vehicle, depending upon the parking option selected.



# Academic Regulations

## ARKANSAS ASSESSMENT OF GENERAL EDUCATION (AAGE) OR RISING JUNIOR EXAM

All undergraduates in Arkansas public institutions who have earned at least 45 hours of credit toward a degree are required to take the Arkansas Assessment of General Education Exam (AAGE), also known as the Rising Junior Exam.

Students transferring from other Arkansas institutions who have earned 45 or more transferable hours must take the exam during the first available test cycle, unless the student has documentation that the AAGE was completed at another college or university in Arkansas. The only students who are exempt from the AAGE requirement are those transferring at least 61 degree credit hours from out-of-state institutions.

Students who do not meet the AAGE requirement by the last day to register for classes will have their classes canceled for that semester.

Testing Services, 730 Hotz Hall, mails exam registration packets to student's local address. For more information on the AAGE, contact Testing Services at (479) 575-2824.

(See also "Advanced Composition" on page 43.)

## ACADEMIC HONESTY

*(Campus Council, revised February 6, 1986)*

### Introduction

The University of Arkansas, Fayetteville, presents this policy as part of its effort to maintain the integrity of its academic processes. Academic honesty should be a concern of the entire university community, and a commitment to it must involve students, faculty, and administrators.

Students must understand what academic integrity is and what the most common violations are. With that understanding they must commit themselves to the highest standards for their own, as well as for their peers', academic behavior.

Public support and encouragement of the faculty is a second critical component necessary to strengthen academic integrity on campus. Faculty members must be continually vigilant in the management of their classes, their assignments, and their tests.

Finally, the administration of the University must present to the students standards of academic integrity. Those standards must be part of a publicly recognized, understood, and accepted set of policies and procedures that can be applied consistently and fairly in cases of academic dishonesty.

It is the responsibility of each student, faculty member, and administrator to understand these policies. A lack of understanding is not an adequate defense against a charge of academic dishonesty.

With regard to the application of this policy, the University assures its support of faculty members and other employees of the University who are acting in good faith in the course and scope of their employment and in the performance of their official duties.

This policy is only a part of the University's effort to promote academic integrity in all aspects of its programs. By necessity, this part discusses only prohibited acts and a process of applying sanctions. The ultimate goal, of course, is to provide an atmosphere that will make superfluous the procedures and sanctions that follow.

### Definitions

Academic dishonesty involves acts that may subvert or compromise the integrity of the educational process at the University of Arkansas. Included is an act by which a student gains or attempts to gain an academic advantage for himself or herself or another by misrepresenting his or her or another's work or by interfering with the completion, submission, or evaluation of work. These include, but are not limited to, accomplishing or attempting any of the following acts:

1. Altering of grades or official records.
2. Using any materials that are not authorized by the instructor for use during an examination.
3. Copying from another student's paper during an examination.
4. Collaborating during an examination with any other person by giving or receiving information without specific permission of the instructor.
5. Stealing, buying, or otherwise obtaining information about an examination not yet administered.
6. Collaborating on laboratory work, take-home examinations, homework, or other assigned work when instructed to work independently.
7. Substituting for another person or permitting any other person to substitute for oneself to take an examination.
8. Submitting as one's own any theme, report, term paper, essay, computer program, other written work, speech, painting, drawing, sculpture, or other art work prepared totally or in part by another.
9. Submitting, without specific permission of the instructor, work that has been previously offered for credit in another course.
10. Plagiarizing, that is, the offering as one's own work the words, ideas, or arguments of another person without appropriate attribution by quotation, reference, or footnote. Plagiarism occurs both when the words of another are reproduced without acknowledgement or when the ideas or arguments of another are paraphrased in such a way as to lead the reader to believe that they originated with the writer. It is the responsibility of all University students to understand the methods of proper attribution and to apply those principles in all materials submitted.
11. Sabotaging of another student's work.
12. Falsifying or committing forgery on any University form or document.

13. Submitting altered or falsified data as experimental data from laboratory projects, survey research, or other field research.
14. Committing any willful act of dishonesty that interferes with the operation of the academic process.
15. Facilitating or aiding in any act of academic dishonesty.

## Procedures

Sanctions for acts of academic dishonesty may be applied in the following ways:

### A. Instructor Action

When an instructor determines or believes that a student in the instructor's class is guilty of academic dishonesty deserving of sanction, the instructor should within five working days follow one of the following: (If the instructor is either a graduate teaching assistant or a temporary faculty member, then a supervising faculty member or the departmental head or chairman may assist in the handling of an academic dishonesty case.)

1. The instructor may determine a grade sanction and within five working days report that sanction along with the essential details of the incident to the judicial coordinator in Student Affairs. There is, under these circumstances, no request for administrative or judicial action. The student sanctioned in this way by an instructor will be notified by Student Affairs and will have five working days from that notification to request a hearing by the All University Judiciary (AUJ) as outlined in Section B below. If the student does not request a hearing within five working days, then it is assumed that the sanction is not contested. The student will be required to have a conference with the judicial coordinator so that the consequences of the action can be made clear.

During the course of the hearing, the student's participation in the affected class should continue so that any action can be reversed without prejudicing the student's academic performance and evaluation. Should the hearing process not support the grading sanction applied by the instructor, then the instructor and student may agree and remedy the sanction with the student proceeding in the class without prejudice. If the instructor and the student cannot so agree, or if the grading sanction cannot be remedied, then the student may appeal via the Academic Appeal Structure for Undergraduate Students.

If the defense of any grade is based on alleged academic dishonesty and the faculty member has not followed the University policy, the ability of the faculty member to defend his or her action may be adversely affected.

2. The instructor may file an incident report form referring the case to the judicial process for determinations of guilt or innocence and the application of sanctions. If the student is determined to be guilty of academic dishonesty, then the instructor may apply a grade sanction in addition to whatever sanctions are applied by the judicial process. While such a case is pending in the judicial process, the student's participation in the affected class should continue to avoid pre-empting the options available after the guilt or innocence is determined. This course of action is appropriate in cases where there is doubt about guilt or innocence or in cases where the offense deserves sanctions beyond the grading system.

### B. Judicial Process

If the instructor chooses to refer the case to the judicial process as outlined in A.2 or if another student, faculty member, or administrator wishes to charge a student with academic dishonesty, the following procedures will be followed:

1. Administrative Action. This would involve the application of a sanction or an admonition or some type of probation following

established guidelines by the judicial coordinator after an incident has been reported by a faculty member, an administrator, or a student. Such action may be appropriate in cases where there is little or no disagreement as to the details of the reported incident. Administrative sanctions may be appealed by any party in the incident to AUJ within three working days of notification of the administrative action.

2. All-University Judiciary (AUJ). This involves applications of sanctions for academic dishonesty after the case has been heard and decided by AUJ. This would be used in contested cases, cases of appeals of instructor or administrative actions, any case involving a student with previous record of academic dishonesty or who previously received a grade sanction for academic dishonesty, and in cases where the sanction could result in suspension or expulsion from the University. The procedures involved in AUJ action are available from Academic Affairs or Student Affairs.

Any action of AUJ may be appealed within five working days through the Vice Chancellor for Academic Affairs to the Chancellor of the University. If the Chancellor discovers evidence previously unavailable to AUJ, then the Chancellor may explain in writing to the Chair of AUJ and ask that AUJ rehear the case.

## Sanctions

The choice of sanctions in cases of academic dishonesty always involves considerations of the integrity of the educational process of the University. There is no place in that process for academic dishonesty; and if a student is undermining the integrity of that process, then separating that student from the University is the natural sanction. The intent of this policy is to make acts of academic dishonesty clear risks, that is, the sanctions are to be sufficiently heavy to deter academic dishonesty. Thus, the application of a grade sanction as the only sanction is to be very carefully considered and should occur only in unusual cases.

The following are possible sanctions for academic dishonesty:

1. Grading Sanctions. An instructor may apply grading sanctions. Such sanctions may also be recommended by either the judicial coordinator in case of administrative action or by AUJ, but the final decision will be that of the instructor. Grade sanctions may consist of either grades of zero or failing grades on part or all of a submitted assignment or examination, or a lowering of a course grade, or a failing grade. All grade sanctions must be appropriately reported as outlined in the procedures above. A grade sanction may be appealed by the student via the Academic Appeal Structure for Undergraduate Students.
2. Admonition or Probation. These are applied by either administrative action or AUJ action. The types:
  - a. Admonition. This is a firm warning against future violations, filed in the office of the judicial coordinator.
  - b. Conduct Probation. This is a probation imposed for a specified period and constitutes a final warning and a second chance to demonstrate what has been learned and to show improved judgment.
  - c. Personal Probation. This is a probation imposed for a specified period and constitutes a final warning of more severe sanctions. This requires the student to meet periodically with a University official to discuss and explore alternatives to the kind of behavior that resulted in the sanction.
  - d. Disciplinary Probation. This is probation imposed for a specified period and constitutes a warning that affects the student's good standing in the University. Violations of regulations during the period are likely to result in suspension or expulsion. During the period, the student is no longer to hold campus offices, receive honors, or represent the Uni-



versity in extracurricular or intercollegiate activities.

- e. Educative Sanctions. These include a variety of assignments, tasks, or experiences that should make the offender more aware of the nature of the general problem of academic dishonesty. These may be applied in conjunction with any admonition or probation.
3. Suspension. Suspensions for a specified period of time from the University may be recommended by AUJ. Such suspensions may be for the remainder of a semester or for a specified number of semesters. In cases of clearly premeditated cheating or cases where either illegal actions or conspiracy with others is involved, suspension for at least the remaining part of a semester or one full semester must be considered as a sanction. Also, suspension will normally be the minimal sanction in cases where a student is guilty of academic dishonesty for a second time.
4. Expulsion. Expulsion from the University for an indefinite period of time may be recommended by AUJ.

### Implementation and Review

For details of procedures for implementing this policy, contact the Office of the Vice Chancellor for Academic Affairs. This University policy does not preclude the implementation by colleges of policies determined by the Vice Chancellor to be more rigorous.

### TERM PAPER ASSISTANCE

*(Campus Council, March 26, 1987)*

The use of 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 automatically result in both punitive action by the instructor (e.g., the award of a grade of "F" for the course) and a referral of each violation to the All-University Judiciary Committee for its consideration.

### ATTENDANCE

Education at the university level requires active involvement in the learning process. Therefore students have the responsibility to attend classes and to actively engage in all learning assignments or opportunities provided in their classes. Instructors have the responsibility to provide a written policy on student attendance that is tied to course objectives included in a course syllabus. There may be times, however, when illness, family crisis, or University-sponsored activities make full attendance or participation impossible. In these situations students are responsible for making timely arrangements with the instructor to make up work missed. Such arrangements should be made in writing and prior to the absence when possible.

Examples of absences that should be considered excusable include those resulting from the following: 1) illness of the student, 2) serious illness or death of a member of the student's immediate family or other family crisis, 3) University-sponsored activities for which the student's attendance is required by virtue of scholarship or leadership/participation responsibilities, 4) religious observances (see UA Religious Observances policy below), 5) jury duty or subpoena for court appearance, and 6) military duty. The instructor has the right to require that the student provide appropriate documentation for any absence for which the student wishes to be excused.

### RELIGIOUS OBSERVANCES

*(Campus Faculty, November 15, 1995)*

Although Christian religious holidays are reflected to some extent in the academic calendar of the University, holidays of other religious groups are not. When members of other religions seek to be excused from class for religious reasons, they are expected to provide their instructors with a schedule of religious holidays that they intend to observe, in writing, before the completion of the first week of classes. The Schedule of Classes should inform students of the University calendar of events, including class meeting and final examination dates, so that before they enroll they can take into account their calendar of religious observances. Scheduling should be done with recognition of religious observances where possible. However, faculty members are expected to allow students to make up work scheduled for dates during which they observe the holidays of their religion.

### FINAL EXAMINATION POLICY

*(Campus Council, revised November 16, 1989)*

It is the policy of the University to minimize student participation in extracurricular activities during the final examination period. No meetings, social activities, athletic events, or other extracurricular activities that require student participation will be scheduled on Dead Day or during the final examination period. Any exceptions to this policy must receive prior approval from the Vice Chancellor for Academic Affairs.

### GRADES AND MARKS

Final grades for course are "A," "B," "C," "D," and "F" [except for courses taken in the School of Architecture]. The grade of "A" is given for outstanding achievement to a relatively small number of excellent scholars. The grade of "B" represents good achievement. The grade of "C" is given for average achievement, and the grade of "D" for poor but passing work. The grade of "F" denotes failure and is given for unsatisfactory work. (No credit is earned for courses in which a grade of "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. Students who fail to present an acceptable reason for not having completed all course requirements including the final examination will receive the grade they would have received had they failed such 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 the grade within the 12-week 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, for example, practice teaching, certain seminars, certain honors colloquia, and courses where credit is earned by examination which the University allows credit toward a degree, but for which no grade points are earned.

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 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. "I," "AU," "CR," "S," and "W" marks will not be counted in the grade-point average. Grades of plus and minus are assigned grade-point values in the School of Architecture – see page 101. The grade-point average is computed by dividing the total number of grade points by the total number of credit hours attempted in courses for which grades (rather than marks) are given. Students who utilized grade renewal in retaking courses (prior to Fall Semester, 1986 and after Fall 1996) have only the last grade used in computing grade-point averages.

### **UNDERGRADUATE GRADE FORGIVENESS POLICY**

*(Campus Council, April 11, 1996)*

Under the Grade Forgiveness Policy, a student may improve the undergraduate cumulative GPA by repeating a maximum of two courses (up to nine hours) in which a grade of "D" or "F" was received and requesting that the repeat grade be the only one that is counted in the calculation. Only two such requests are available to any student in his or her undergraduate career. The repeated grade must be in the same course taken at the University of Arkansas, Fayetteville. Only a course in which a grade of "D" or "F" was earned may be repeated under the Forgiveness Policy. Grade Forgiveness may not be used to replace a grade assigned as a result of academic dishonesty. The student must file a written petition to use grade forgiveness indicating which course(s) he/she chooses to grade renew: the petition must be completed and approved prior to graduation. Both attempts at the course will remain on the transcript but only the second will be used to calculate both credit and GPA. The first attempt and the grade earned will be recorded on the transcript with the symbol "R" to denote that it has been repeated. Students considering Grade Forgiveness should be aware that many graduate schools, professional schools, employers or other institutions in considering admission or employment recompute the GPA and include all courses attempted even though a course was repeated. This means that if the cumulative GPA has been raised because of grade renewal, the recomputed GPA will be lower.

### **SEMESTER HONOR ROLL**

The colleges of the University publish, after the close of each semester, an honor roll of the highest ranking students in the college containing the names of not more than 10 percent of the undergraduate students

of each class. Students are eligible for the honor roll if they are carrying at least 12 semester hours normally required for graduation by their college for their respective year. Most colleges refer to this part of the honor roll as the "Dean's List."

In addition, a Chancellor's List is published each semester which recognizes those undergraduate students who achieve a 4.00 grade-point average. Students must also be carrying at least 12 semester hours normally required for graduation to be eligible for the Chancellor's List.

For honor roll eligibility, the 12 semester hours must all be in courses for which grade points are earned.

### **FIRST-RANKED SENIOR SCHOLARS**

A first-ranked senior scholar shall be recognized at the annual Commencement of the University of Arkansas, Fayetteville. The scholar or scholars so recognized must have a cumulative grade-point average of 4.00 on all course work completed at the time selection is made and must have completed all courses required for the baccalaureate degree at the University of Arkansas, Fayetteville, or in a program of study approved by the Director of Honors or other designee in the college in which the student is enrolled. In determining the cumulative grade-point average for the purposes of such awards, grade-renewal is not accepted.

### **SENIOR SCHOLAR**

Since 1941 a key has been awarded to the graduating senior from each undergraduate college who has the highest grade-point average and who has completed at least half of his or her degree work at the University of Arkansas. The keys are awarded during the Honors Banquet.

### **ACADEMIC PROGRESS, SUSPENSION AND DISMISSAL**

A student's academic standing in the University is determined at the end of each term of enrollment (fall, spring or summer) on the basis of the student's cumulative and/or term grade-point average (GPA) and number of hours earned. See the chart below for the required performance levels. The student's academic standing governs his or her reenrollment status and determines any conditions associated with reenrollment or denial of enrollment for a subsequent term. Normally, students will be notified individually by the University of their standing shortly after the end of each term. However, this policy statement is the formal notification to all students of the conditions that determine academic standing and the consequences for each term, regardless of individual notification.

### **ACADEMIC STANDING CHART**

CUMULATIVE HOURS EARNED	GOOD ACADEMIC STANDING	Placed on ACADEMIC WARNING	Continued on ACADEMIC WARNING	SUSPENDED*	DISMISSED**	Continued on ACADEMIC WARNING
	Determine status when	when	when	when	when	Following Suspension and Following Dismissal when
	CUMULATIVE GPA is	CUMULATIVE GPA is	TERM GPA is	TERM GPA is	TERM GPA is	TERM GPA is
0-16 hours	1.50 or higher	Less than 1.50	1.50 or higher	Less than 1.50	Less than 2.00	2.00 or higher
17-32 hours	1.60 or higher	Less than 1.60	1.60 or higher	Less than 1.60	Less than 2.00	2.00 or higher
33-45 hours	1.75 or higher	Less than 1.75	1.75 or higher	Less than 1.75	Less than 2.00	2.00 or higher
46-60 hours	1.90 or higher	Less than 1.90	1.90 or higher	Less than 1.90	Less than 2.00	2.00 or higher
61 hours +	2.00 or higher	Less than 2.00	2.00 or higher	Less than 2.00	Less than 2.00	2.00 or higher

\* No student may be suspended who has not spent the prior term of enrollment on academic warning.

\*\* No student may be dismissed who has not been suspended during a prior term of enrollment.

*Good Standing:* Upon initial admission and during a student's first term of enrollment, except for transfer students, the student is in good standing. (The standing of a transfer student reflects the student's prior record and the status assigned upon admission). A student remains in, or returns to, good academic standing at the end of any term when the cumulative GPA is at or above the required minimum.

*Academic Warning:* When a student's cumulative GPA falls below the minimum required for good standing, the student will be put on academic warning. This status is not recorded on the student's permanent academic record and will not appear on transcripts. A student who enrolls for a term on academic warning may take no more than 12 hours (unless more are approved by the student's adviser and dean). To continue for one or more additional terms on academic warning, the student must earn a term GPA at or above the cumulative GPA required for good standing. The student can remain on academic warning until the cumulative GPA is at or above the required minimum for good standing unless the student becomes subject to academic suspension by failing to earn the required term GPA.

*Academic Suspension:* A student on academic warning who does not earn the minimum required term GPA will be suspended from full-time enrollment. No student may be suspended who has not spent the prior term of enrollment on academic warning. A student on academic suspension has two alternatives: limited enrollment or academic leave of one year from the University.

Students who choose limited enrollment may enroll for up to nine (9) hours of on-campus or Independent Study course work (as approved by the student's adviser and dean) and must earn at least six (6) hours of credit with grades of C or higher in all courses taken. A student who meets these conditions may enroll for a subsequent term on academic warning following suspension.

Students who choose academic leave may apply for readmission one year after the term of the suspension. A student who does not earn credit from another institution will be readmitted on academic warning following suspension. A student who earns credit from another institution(s) during or subsequent to the year of suspension must apply to the University for admission as a transfer student and will be granted academic standing consistent with transfer admission policy and the student's record.

*Academic Warning Following Suspension:* A student on academic warning following suspension may take no more than twelve (12) hours (unless more are approved by the student's adviser and dean) and must earn a term GPA of 2.00 or higher for each term of enrollment until the student's cumulative GPA is at the level required for good standing. Failure to satisfy these requirements will result in dismissal.

*Academic Dismissal:* A student on academic suspension or academic warning following suspension who does not earn a term GPA of 2.00 or higher and satisfy all other requirements associated with his or her status will be dismissed from the University. A student who has been dismissed may be readmitted only upon action of the Academic Standards Committee. Course work taken through Independent Study while under dismissal may be submitted to the committee as evidence of academic competence. If readmitted, the student may receive degree credit for such course work.

*Academic Warning Following Dismissal:* A student who enrolls subsequent to an initial dismissal and following favorable action of the Academic Standards Committee is placed on academic warning following dismissal and may take no more than 12 hours (unless more are approved by the student's adviser and dean) and must earn a term GPA of 2.00 or higher. Failure to satisfy these requirements will result in a second academic dismissal. A second dismissal is for five years, after which a student must apply for readmission to the University and may also apply for Academic Bankruptcy. Individual colleges or programs have the discretion to set academic admission and continuation standards for specific programs that are higher than University standards.

(VCAA 6/8/00)

## REQUIREMENTS FOR GRADUATION

### University Core Requirements (See page 44)

The University of Arkansas has adopted a "State Minimum Core" of 35 semester-credit-hours of general education courses that are required of all baccalaureate degree candidates. This is in compliance with Arkansas Act 98 of 1989 and the subsequent action of the Arkansas State Board of Higher Education. Beginning in the fall semester of 1991, all state institutions of higher education in Arkansas have a 35-hour minimum core requirement with specified hours in each of six academic areas. The University has identified those courses that meet the minimum requirement and they are listed in the table on page 44.

Students should consult the requirements for specific colleges and programs when choosing courses for use in the UA University Core.

### Freshman Composition

Every undergraduate student at the University of Arkansas is required to submit six hours of freshman composition for graduation. Freshman English courses taken at other universities will satisfy this requirement only if they are courses in composition. Students whose ACT scores in English are 18 or below must enroll in the sequence of courses ENGL 0003, ENGL 1013, and ENGL 1023. Students whose ACT scores in English are between 19 and 27 should enroll in ENGL 1013-1023. Students with English ACT scores of 28 or above may enroll in Honors English (1013H-1023H) or regular English (1013-1023). Students with English ACT scores of 30 or above may take 1013H-1023H or elect exemption. Students electing exemption must fill out forms in the English Department office. Some programs require credit in composition, and students should confer with their advisers before choosing exemption.

### American History and Civil Government

Under Arkansas law, no undergraduate degree may be granted to any student who has not passed a college course in American history and civil government. Courses offered by the University of Arkansas, any one of which will meet this requirement, are HIST 2003 (History of the American People to 1877), HIST 1013 (History of the American People, 1877 to Present), and PLSC 2003 (American National Government).

### Advanced Composition

Every undergraduate student at the University of Arkansas is also required to take and pass ENGL 2003, a three-hour course in composition, unless exemption can be gained in one of the following ways: (1) by demonstrating a satisfactory writing ability on the Advanced Composition Exemption Examination, (2) by completing ENGL 1013 (Essay Writing), or (3) by achieving a grade of "A" or "B" in ENGL 1013 and a grade of "A" in ENGL 1023 in courses taken at the University of Arkansas, Fayetteville.

ENGL 2003 will not count as part of the total number of hours required for a degree in the College of Engineering or School of Architecture or the Food, Human Nutritional Hospitality curriculum in the School of Human Environmental Sciences in the College of Agricultural, Food and Life Sciences.

Students must satisfy the requirement of ENGL 1013 and ENGL 1023 and complete 30 credit hours before taking the Advanced Composition Exemption Exam. The exam must be taken before the student has acquired 96 credit hours. The English requirement applies to all transfer students regardless of nonfreshman composition courses taken at other schools. The examination must be taken by junior and senior transfer students at the time they enter the University of Arkansas.

Students not gaining exemption from ENGL 2003 must register for the course before the last semester of their senior year.

Continued on page 45 . . .

University Core (State Minimum Core)<sup>1</sup>

Areas	Minimum Hours	University Courses	Areas	Minimum Hours	University Courses
English	6	ENGL 1013, Composition I ENGL 1023, Composition II			PHIL 3103, Ethics and the Professions
Mathematics <sup>2</sup>	3	MATH 1203, College Algebra Any higher-level mathematics course required by major			c) Humanities: CLST 1003, Intro Classical Studies: Greece CLST 1013 Intro Classical Studies: Rome
Science <sup>3</sup> (Students admitted under this catalog or later are required to take corresponding lecture/lab combinations as listed.)	8	ASTR 2003/2001L, Survey of the Universe BIOL 1543/1541L, Principles of Biology BOTY 1613/1611L, Plant Biology CHEM 1023/1021L, Basic Chem/Health Science CHEM 1053/1051L, Chem in Modern World CHEM 1074/1071L, Fundamentals of Chemistry CHEM 1103/1101L, University Chemistry I CHEM 1123/1121L, University Chemistry II CHEM 1213/1211L, Chemistry for Majors I/Lab CHEM 1223/1221L, Chemistry for Majors II/ Lab GEOL 1113/1111L, General Geology GEOL 1133/1131L, Environmental Geology PHYS 1023/1021L, Physics and Human Affairs PHYS 1044, Phys for Architects I PHYS 1054, Phys for Architects II PHYS 2013/2011L, College Physics I PHYS 2033/2031L, College Physics II PHYS 2054, Univ Physics I PHYS 2074, Univ Physics II ZOOL 1613/1611L, Principles of Zoology ZOOL 2213/2211L, Human Physiology ZOOL 2443/2441L, Human Anatomy			ENGL 2113, English Lit to 1798 ENGL 2123, English Lit 1798 to Present HUMN 1114H, Roots/Cultures to 500 CE HUMN 1124H, Equilibrium of Cultures, 500 to 1600 WLIT 1113, World Lit I WLIT 1123, World Lit II
					d) Humanities: Any Foreign Language 2003 <sup>5</sup> HUMN 2003, Intro to Gender Studies
			U.S. History	3	HIST 2003, History of Amer. People or Government to 1877 HIST 2013, History of Amer. People 1877 to Present PLSC 2003, American National Government
			Social Sciences <sup>6</sup> (Select from at least two different fields of study)	9	AGEC 1103, Prin of Agri Micro-economics AGEC 2103, Prin of Agri Macro-economics ANTH 1023, Intro to Cultural Anth ECON 2013, Prin of Macroeconomics ECON 2023, Prin of Microeconomics ECON 2143, Basic Economics: Theory & Practice GEOG 1123, Human Geography GEOG 2023, Economic Geography GEOG 2103, Emerging Nations GEOG 2203, Developed Nations HESC 1403, Life Span Development HESC 2413, Family Relations HIST 1113H, Honors World Civilization I HIST 1123H, Honors World Civilization II HIST 2003, History of Amer. People to 1877 <sup>7</sup> HIST 2013, History of Amer. People 1877 to Present <sup>7</sup> PLSC 2003, American National Government <sup>7</sup> PLSC 2013, Intro to Comparative Politics PLSC 2203, State & Local Gov PSYC 2003, General Psychology RSOC 2603, Rural Sociology SOC 2013, General Sociology SOC 2033, Social Problems WCIV 1003, Western Civilization I WCIV 1013, Western Civilization II
Fine Arts, Humanities <sup>4</sup> (Select 3 hours each from two of these four categories)	6	a) Fine Arts: ARCH 1003, Architecture Lecture ARHS 1003, Art Lecture ARTS 1003, Art Studio COMM 1003, Film Lecture DANC 1003, Basic/Movement & Dance DRAM 1003, Theater Lecture HUMN 1003 Introduction to the Arts and Aesthetics LARC 1003, Basic Course in the Arts: The American Landscape MLIT 1003, Music Lecture b) Humanities: PHIL 2003, Intro to Philosophy PHIL 2103, Intro to Ethics PHIL 2203, Logic			

Footnotes are on page 45.

**Footnotes for the State Minimum Core on page 44:**

- 1 Arkansas Common Course Index for "State Minimum Core". Listed below are courses that have been indexed in the Arkansas Common Course Index System (ACCIS). The University Course number is listed first followed by the ACCIS number. English: ENGL 1013-ENGL 1301, ENGL 1023-ENGL 1302. Science: BIOL 1543/1541L-BIOL 1408, BOTY 1613/1611L-BIOL 1411, CHEM 1103/1101L-CHEM1411, CHEM 1123/1121L-CHEM 1412, GEOL 1113/1111L-GEOL 1403, GEOL 1133/1131L-GEOL 1404, PHYS 2013/2011L-PHYS 1403, PHYS 2033/2013L-PHYS 1404, PHYS 2054, PHYS 2425, PHYS 2074, PHYS 2426, ZOO 1613/1611L-BIOL 1413. Fine/Arts: ARHS 1003-ARTS 1301, DRAM 1003-DRAM 1310, HUMN 1003-HUMA 1301, MLIT 1003-MUSI 1306, PHIL 2003-PHIL1301, PHIL 2103-PHIL 2306, PHIL 2203-PHIL 2301, ENGL 2113-ENGL 2322, ENGL 2123-ENGL 2323, WLIT 1113-ENGL 2332, WLIT 1123-ENGL 2333. U.S. History: HIST 2003-HIST 1301, HIST 2013-HIST 1302, PLSC 2003-POLS 1302. Social Sciences: ANTH 1023-ANTH 2351, ECON 2013-ECON2301, ECON 2023-ECON 2302, GEOG 1123-GEOG 1301, HIST 2003-HIST 1301, HIST 2013-HIST 1302, PLSC 2003-POLS 1302, PSYC 2003-PSYC 2301, SOCI 2013-SOCI 1301, SOCI 2033-SOCI 2303, WCIV 1003-HIST 2311, WCIV 1013-HIST 2312
- 2 Some students majoring in math, engineering, science and business may be required to take a higher math as part of the State Minimum Core.
- 3 Some students majoring in math, engineering, science, education and health-related professions may be required to take higher or specific science courses as part of the State Minimum Core.
- 4 Some students majoring in engineering may be required to take either six hours of humanities or social sciences at the junior/senior level or substitute an additional six hours of higher math and/or additional science as part of the State Minimum Core.
- 5 Students may choose any intermediate-level foreign language course numbered 2003. See Foreign Languages.
- 6 Some students majoring in engineering may be required to take either six hours of humanities or social sciences at the junior/senior level or substitute an additional six hours of higher math and/or additional science as part of the State Minimum Core.
- 7 If not selected to meet the first three hours of the social sciences requirement.

*Continued from page 43 . . .*

The examination will be graded in the following categories: (1) pass, (2) fail, and (3) borderline. The students whose papers are in the third category (borderline) will be eligible to submit a second writing sample at the regularly scheduled Junior English Exemption Exam in the following semester. Students who take and do not pass the Exemption Exam must take ENGL 2003. Students who meet the Advanced Composition Requirement also will have met the writing requirement of the Rising Junior Exam (AAGE). See page 39.

**Residence**

The full senior year must be completed in residence except that a senior who has already met the minimum residency requirement will be permitted to earn not more than 12 of the last 30 hours in extension or correspondence courses or in residence at another accredited institution granting the baccalaureate degree. No more than six of these 12 hours may be correspondence courses. The minimum residence requirement is 36 weeks and 30 semester hours. Residency for the senior year is defined as a period during which the student must be enrolled in courses offered on the campus in Fayetteville. This is intended to provide adequate contact with the University and its faculty for each student who is awarded a degree. Colleges and departments have the authority to prescribe residence requirements that exceed those described here.

**Minimum Credit Hours**

All students awarded a baccalaureate degree must have a minimum of 124 credit hours. Individual programs may require additional hours.

**Minimum Grade-Point Average**

No student will be allowed to graduate if the student has "D" grades in more than 25 percent of all credit earned in this institution and presented to meet the requirements for a degree. No student will be allowed to graduate if on warning.

**Application for Graduation**

Students who plan to graduate must file an official application to do so. Applications should be filed for the term in which degree requirements will be completed. A graduation fee will be required at the time of application.

Students intending on completing requirements during the spring semester should file their applications by the priority consideration deadline published in the schedule of classes. This will help ensure their names will be listed in the commencement program and receive priority when diplomas are mailed.

Students completing requirements during fall or summer terms must file an application by the deadlines established for those terms.

A student who fails to complete the degree during the intended semester must renew the application and pay a renewal fee for the term in which the degree requirements will be completed.

**Other Graduation Requirements**

Individual colleges and schools may have special graduation requirements, in addition to degree program requirements. Consult the college or school section in this catalog for statements of additional requirements.

**Degree Program Requirements**

A student's degree program requirements are normally those specified in the catalog for the student's first year of enrollment. Students may choose to meet the program requirements specified in a catalog for a later year. Students may be required to meet degree program requirements incorporated into the curriculum at a level beyond that at which the student is enrolled.

Students who transfer from institutions with articulation agreements with the University may also be allowed to meet the University program requirements in effect during their first year of enrollment in those institutions, subject to the time limits described below and the availability of course work. Students who transfer to a different degree program may be required to meet the program requirements specified in the catalog for the year of entry into that program. Students who are not enrolled for a period of two years or longer may be required to reenter under program requirements in the current catalog. Students who wish to be granted a degree on the basis of requirements specified in a catalog more than seven years old may be required to petition the college or school to be allowed to do so.

Students are expected to keep themselves informed regarding program requirements and changes.

**GRADUATION HONORS**

The faculty of each college will recommend for graduation with honors or with high honors those students it considers to be eligible for such distinction under its own regulations with the following general restrictions:

1. A student to be eligible for graduation honors must have completed at least one-half of his or her degree work at the University of Arkansas.
2. No student shall be eligible for graduation honors whose cumulative grade-point average is below 3.125.
3. A college should not be expected to recommend more than 10



percent of its graduating class for graduation honors except under unusual circumstances.

4. It is recommended that in determining graduation honors the faculty consider the whole of a student's record but give greater weight to the last half of the record than to the first half.

### ADDITIONAL BACHELOR'S DEGREE

A person with a bachelor's degree from the University of Arkansas, or from any other institution, may not receive another bachelor's degree without completing in residence at least 30 hours of additional, not necessarily subsequent, courses selected from the courses leading to a degree for which the person is a candidate.

More than 30 hours of coursework may be required. In addition to the college or school requirements, the candidate must also meet all University requirements as stated in the catalog, including graduation and core requirements, except when coursework for the first degree satisfies requirements for the second.

### GRADUATION RATES

In accordance with the Student Right-To-Know and Campus Security Act of 1990, the following is a summary of the institution's six-year graduation rates:

#### Fall 1996 Graduating, Bachelor, Degree-Seeking Freshmen

	Men	Women	Overall
Total Graduates	448	548	996
Percent of Total	42%	50%	46%

#### Fall 1996 Graduating Student Athletes Who Received Athletically Related Aid

Percent of Total: 42%

### 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 Registrar's Office written requests that identify the record(s) they wish to inspect. The appendix to Universitywide Administrative Memorandum 515.1 provides a list of the types and locations of education records, the custodian of those records, and copying fees for each individual campus. 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 Universitywide Administrative Memorandum 515.1.

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 the Universitywide Administrative Memorandum 515.1

3. The right to withhold consent of disclosure of directory information, which information: the student's name; address; telephone number; date and place of birth-; religious preference; major field of study; classification by year; number of hours in which enrolled and number completed; parent's or spouse's names and addresses; marital status; participation in officially recognized activities and sports; weight and height of members of athletic teams; dates of attendance including matriculation and withdrawal dates; degrees, scholarships, honors, and awards received, including type and date granted; most recent previous education agency or institution attended; and photograph.

This information will be subject to public disclosure unless the student informs the Registrar's Office in writing each semester that he or she does not want his information designated as directory information. To prevent publication of name in the printed student directory, written notice must reach the Registrar's Office by August 31 of the Fall semester

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.

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. University wide Administrative Memorandum 515.1 is available on request in the main library on campus.

### PHOTOGRAPHIC AND VIDEO IMAGES

The University is proud to publish and display photographic and video images of UA students, their activities and accomplishments. Any student who does not wish to be represented in such photographic and video images by the University should notify the Office of the Registrar, Hunt 146, in writing before the end of the first week of classes each semester. The request will be honored for all publications and communications undertaken during the remainder of any semester when notification has been received.

## WAIVER OF ACADEMIC POLICIES

The Academic Standards Committee, composed of faculty and students, serves as a referral body for matters of probation, suspension, dismissal, and other rules and regulations related to academic progress and graduation. Petitions for waiver of academic rules and information on the petitioning process may be obtained at the offices of the academic deans or the Registrar. Petitioners should note petitioning deadlines.

## STUDENT ACADEMIC APPEALS AND COMPLAINTS

There are two kinds of procedures for undergraduate students to pursue with complaints of an academic nature. Refer to the *Student Handbook* for appeals structures for other grievances.

### Grade Appeal Structure for Undergraduate Students

If a student questions the fairness or accuracy of a grade there is recourse through a student grade appeal structure. Disagreements shall be heard that allege the instructor's policy was not applied consistently to all students, differed substantially from the announced policy, or that a policy was not announced. All grievances concerning course grades must be filed within one calendar year of the end of the term in which the grade that is being appealed was assigned. The procedures are:

1. The student should first discuss the matter with the instructor involved, doing so as soon as possible after receiving the grade. The instructor should be willing to listen, to provide explanation, and to be receptive to changing the grade if the student provides convincing argument for doing so. The student's questions may be answered satisfactorily during this discussion.
2. If the student chooses to pursue the grievance, the student shall take the appeal in written form to the appropriate department chairperson. That person, if she or he believes the complaint may have merit, will discuss it with the instructor.
3. If the matter remains unresolved, it will be referred to an ad hoc committee composed of the entire faculty of the instructor's department. The committee will examine available written information on the dispute, will be available for meetings with the student and with the instructor, and will meet with others as it sees fit.
4. If the faculty committee, through its inquiries and deliberations, determines that the grade should be changed, it 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 an explanation for refusing.
5. If the faculty committee, after considering the instructor's explanation, concludes it would be unjust to allow the original grade to stand, it may then recommend to the department chairperson that the grade be changed. That individual 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 is then obligated to change the grade, notifying the instructor and the student of this action. Only the chairperson 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. If the faculty committee determines that the grade should not be changed, it should communicate this conclusion to the student, the faculty member, and the chair.

### Student Complaint Procedure

This procedure is designed to give all students a means by which an academically related complaint against an instructor other than that which is solely concerned with a grade (covered by the previous section) may be reviewed and acted upon in such a way as to protect the

rights of both the student and the instructor. The procedure must be initiated within one calendar year of the occurrence of the cause for the complaint.

*Guidelines:* All committee discussions or hearings shall be private. Furthermore, every effort shall be made to protect any person against discrimination as a result of statements or actions made in this procedure, but fraudulent or intentionally deceptive statements and/or allegations shall be considered an extremely serious violation of the procedures and could result in a recommendation for grave disciplinary measures. Nothing in this procedure may violate policies stated under "Appointments, Promotions, Tenure, Non-reappointment, and Dismissals" in the Faculty Handbook.

*Definitions of Terms:* **Student** – Under this procedure, a student is any person who has been formally admitted to the University of Arkansas and who is or was enrolled as an undergraduate student at the time the alleged grievance occurred. (A separate procedure exists for graduate students.) **Decision** – A decision will include a review of the issues, a determination about the validity of the complaint, the reasons for the determination, and any recommendations. A decision will be stated in writing. **Working Days** – Working days refer to Monday through Friday, excluding official University holidays.

*Procedures:* The normal course for a student or a group of students with an academically related complaint concerning an instructor is to go first to that instructor, although the student or group may appeal to the instructor's chairperson, supervisor, or dean in an attempt to resolve the problem informally and amicably. However, if a student has a complaint regarding academic concerns not covered under the "Academic Appeal Structure" and, for whatever reason, does not wish or is unable to resolve the issue informally, the student is entitled to have the issue considered under the following normal procedures.

1. The student will submit a written complaint with supporting information to the Vice Chair of the Campus Council or to the Chair of the Student Panel or to the Chair of the Faculty Panel (as described in Paragraph 4 below). These three persons will comprise a Contact Committee, with the Vice Chair of the Campus Council as coordinator, and will be responsible for the initial review of the student's complaint. If the Contact Committee, without any preliminary investigation, agrees unanimously that a particular complaint is not subject to these procedure or should not be pursued, the student will be notified in writing. No further action will be taken under these procedures unless the student files within five working days a written request for a preliminary investigation by the Contact Committee or for an investigation by a Hearing Committee; this request will be honored, and the instructor shall be informed immediately about the filing of the complaint, the nature of the complaint, and the initiation of the investigation. Deliberate and cautious discretion will be used to preserve a student's anonymity (if possible, depending upon the nature of the complaint) and to protect the faculty member from presumptive suspicion.
2. If through lack of unanimous agreement or as a result of the student's request the Contact Committee pursues the complaint, the Committee will initiate the preliminary investigation.

The preliminary investigation should be completed within fifteen working days, if possible, from the date the request is received. After the investigation, the Contact Committee has a choice of two alternatives:

- a. It will make a determination regarding the complaint and will notify in writing both parties; or
- b. It will determine that a Hearing Committee should be appointed and that a more thorough investigation should be conducted. Both parties will be advised of this determination and of who has been appointed to serve on the Hearing Committee.



3. If the Contact Committee has made a determination regarding resolution of the complaint and if either party is not satisfied with this determination, that party has a prerogative of requesting and having a Hearing Committee appointed to investigate the matter further.
4. Members of a Hearing Committee will be selected from two panels of 15 persons each: one of students, chosen by ASG; and one of faculty members, chosen by the Faculty Committee on Committees. The Chair of the Student Panel will be selected by the ASG President, and the Chair of the Faculty Panel will be selected by the Chair of the Campus Faculty.
5. When an investigation by a Hearing Committee becomes necessary, the Committee will be appointed immediately by the Contact Committee. The Hearing Committee will be composed of three students and of four faculty members, chosen to avoid obvious bias or partiality. The coordinator of the Contact Committee will call the initial meeting of the Hearing Committee to conduct an election of a chairperson from among the four faculty members and to review general information and results of any preliminary investigation.
6. Either party to the dispute may ask another member of the University community to attend the hearings and may ask any member of the University community to provide relevant information. At the end of its investigation, which, if possible, should be completed within 20 working days after its first meeting, the Hearing Committee will submit its decision to both parties.
7. If the decision is not acceptable to either the student or the instructor, that person may appeal in writing to the Vice Chancellor for Academic Affairs of the University. The Vice Chancellor for Academic Affairs will review the Hearing Committee's written report and will forward a written recommendation to the student, the instructor, and the Chairperson of the Hearing Committee.

# Academic Facilities and Resources

## UNIVERSITY LIBRARIES

The library system of the University of Arkansas, Fayetteville, is composed of the David W. Mullins Library (the main research facility on campus) and five branch libraries: the Robert A. and Vivian Young Law Library, the Fine Arts Library, the Chemistry Library, the Physics Library, and the Learning Resources Center. The combined holdings of the libraries total over 1.6 million volumes of books and bound periodicals and over 3 million items in microform. The Libraries currently receive over 17,000 separate journal and serial publications by subscription, gift, and exchange. Other resources in the collections include over 24,000 audio and visual materials, and several thousand maps, electronic databases (indexes and full text), and manuscripts.

The University Libraries maintain a membership in the AMIGOS Bibliographic Council and the Center for Research Libraries (CRL). Through OCLC, the Libraries share cataloging and interlibrary loan information with hundreds of libraries all over the world. The University Libraries' records are computerized on the Info-Links library system. Holdings information may be accessed and searched from computers within the library, as well as from computers in homes, offices, or dorm rooms via modem or network connection. General and specialized indexing and abstracting databases, and electronic full-text resources, may also be accessed through InfoLinks or through the library's electronic home page (accessed through the University home page or directly at <<http://www.uark.edu/libinfo>>), which provides a wide variety of other information services, as well.

Anyone with a University ID card may check out materials through the Libraries' convenient electronic checkout system. Students may also renew library materials and request holds electronically, without assistance, by using their University ID number to access their circulation record. Loan periods are of various lengths as defined by circulation policies, which are available at the circulation desk or through the library home page. When faculty members or graduate students need items that are not available in the University Libraries, the Interlibrary Loan Department provides the service of obtaining materials and delivering them—often electronically to student and faculty desktops—from other cooperating libraries.

The Reference Department assists users in locating and using library resources. Reference librarians are ready to help students use InfoLinks and electronic databases. In addition, librarians offer orientation sessions and various library instruction sessions on research methods to various classes in all the colleges on campus.

The Government Documents Department in Mullins Library assists library users in finding government information. The library is a depository for publications of the federal government and the state of Arkansas. In addition, the library archives selected documents from other states, foreign countries, the United Nations, and other international

organizations. Information is available in print, microform, or electronic formats. The Periodicals Room houses the microform collections, as well as equipment for photocopying microforms, and offers check-out of microfilm readers for personal use.

The Special Collections Division in Mullins Library acquires and preserves material for research in the history, politics, literature, natural environment, and culture of Arkansas and surrounding regions. Through this division, scholars have access to a rich assortment of books, pamphlets, periodicals, photographs, maps, and manuscript collections to support their work. Among the more than 18,000 linear feet of manuscript collections available are the papers of J. William Fulbright, David H. Pryor, Dale Bumpers, Asa Hutchinson, Joe T. Robinson, Hattie Caraway, John Paul Hammerschmidt, Ed Bethune, Beryl Anthony, Brooks Hays, Orval Faibus, Jeff Davis, Daisy Bates, Edward Durell Stone, William Grant Still and Verna Arvey, John Gould Fletcher, Frederick Lee Liebolt, James M. Hanks, Ruth Polk Patterson, Vance Randolph, Elizabeth Huckaby, Alfred E. Smith, Mary D. Hudgins and records of organizations such as the Arkansas Council on Human Relations, the Council of International Exchange of Scholars, Peace Links, and Southland College. The Division also houses the library's Rare Book Collection and other material.

For information concerning collections and services, as well as information on carrel space, computer laptop loans for in-house use, group study rooms, seminar rooms, reserve policies, book and journal ordering procedures, or any other library matter, inquire at any library public service desk or at the Dean's Office in Mullins Library.

## QUALITY WRITING CENTER

The Quality Writing Center, established in 1984, provides an array of services to the University of Arkansas community. The center's primary focus is one-on-one tutorials with students, faculty, and staff who want to consult about problems with writing projects such as freshman essays, technical reports, research papers, theses and dissertations, or articles for publication.

Faculty and graduate tutors work with writers on various matters, including brainstorming, organization, transitions, style formats, revision and editing strategies, usage, grammar, and punctuation. During these sessions, staff members ask and answer questions, give reader responses, and help writers take charge of their writing.

The center also assists faculty in planning and evaluating writing assignments and provides clients with assignments, models, articles and books for them to consult. Besides working with faculty and the general student body, the center also helps students for whom English is a second language (ESL); books and handouts are available to review standard English, and the staff works directly with a client to help her or him understand the subtleties of writing assignments. Another small group

the center helps is non-traditional students who may need to review writing and grammar skills and who may need personalized help to regain confidence in writing. For students writing editorials, petitions, resumes, job applications, or essays for scholarships and medical or graduate school, the center offers tutorials and provides resource books.

The center has a computer lab where writers may research the Internet, access library resources, write, and easily revise their work after tutorials. Patrons may also access our services through the World Wide Web at <<http://www.uark.edu/write>>.

## COMPUTING FACILITIES AND RESOURCES

The department of Computing Services supports research, academic, and administrative computing activity on the UA campus. Computer operations are maintained to provide access to computing facilities and resources 24 hours a day, seven days a week.

A variety of host systems and servers are available for academic use. The primary mail and messaging server on campus, [mail.uark.edu](mailto:mail.uark.edu), is a SunFire 880. A variety of e-mail clients are supported; the primary one in use by students is Netscape Messenger, a browser-based client, providing access to e-mail from any location that is Internet connected via a Web-browser (at <http://mail.uark.edu>). The primary host for academic and research computing is [comp.uark.edu](http://comp.uark.edu), a Sun Enterprise 6500, using the Unix operating system Solaris. Comp supports statistical packages (SAS, SPSS, MATLAB), programming languages (C, C++, FORTRAN, Pascal), e-mail software (Pine), and other Internet applications. Personal home pages may also be developed on the comp server. All students are automatically assigned accounts on [mail.uark.edu](mailto:mail.uark.edu) and [comp.uark.edu](http://comp.uark.edu), and Active Directory, which allows students, staff, and faculty access to computers in the General Access Computing Labs.

A variety of other servers provide support for both administrative and academic computing. These include an IBM 9672 Model RB5 mainframe for administrative computing for campus student information, human resource, and business processing systems; data warehousing; Web services; and file and print services, among others. Some departments participate in Computing Services' Intel-based file services, allowing them access to PC and Mac-based software through these servers. Additionally, the General Access Computer Labs maintain software via networked servers, allowing access to the same products in multiple labs. Faculty may also access the administrative computing systems for advising purposes, roster generation, and grade reporting. Host peripherals include disk storage, tape systems, and laser printing.

UARKnet, the campus backbone network, is managed by Computing Services. This network enables communication among networks, computers, and servers on campus, as well as on the Internet and Internet2, of which the University is a member site. Virtually all departments, as well as all laboratories, are connected to the campus network. Network access is also available via dial-up modem connections. Dial-up access requires an ID and password, and students have access to a "student only" pool.

The General Access Computer Labs offer approximately 300 network-attached PCs and Macintoshes for use by University students, faculty, and staff. These labs are located in the Arkansas Union, Administrative Services Building, Sam Walton Business Building, Mullins Library, and the Enhanced Learning Center located in Gregson Hall (scheduled to open Fall, 2003). The labs offer day, evening, and weekend hours. In addition to being Internet-connected, a variety of products are installed on these machines, including Web applications (Netscape and Internet Explorer), word processors (MS Word and WordPerfect), databases (MS Access), and spreadsheet programs (MS Excel). Laser printing is available from all supported software. Scanning facilities are available in the Administrative Services Building and the Arkansas Union labs, and color printing is available in the Union. Laptops are available for check-out in Mullins to use standalone or with network

access via the wireless network in Mullins. Personal laptops may also connect to the network through public drops located in Mullins and the Union, as well as through the campus wireless network.

Computing Services offers free, non-credit short courses every month on a variety of computer and internet-based topics, including operating systems, e-mail, word processing, Web-page development, Internet navigation, presentation tools, and many others.

The MultiMedia Resource Center (MMRC) provides access to and training for computers and applications that can be used to develop programs and classroom presentations. In addition, the MMRC features a training lab, including internet-connected computers equipped for video conferencing and distance education applications. The MMRC also has presentation equipment, laptops, and a portable IP-based video conferencing unit available for checkout. The Research Data Center provides researchers with assistance in data design and analysis and with support for other needs, such as training and access to numeric data and assistance in using Web-based data.

Computing Services is located in the Administrative Services Building (ADSB) at 155 Razorback Road. Computing Services specialists offer assistance with operating systems, application programs, virus scanning, modem communications, Internet tools, research projects, general troubleshooting, etc. For more information, call the Computing Services Help Desk at 575-2905, Monday-Thursday from 7 a.m. to 6 p.m. and Friday until 5 p.m., or visit the Computing Services Web site at <<http://www.uark.edu/campus/compserve/>>.

## UNIVERSITY MUSEUM

The University Museum has been an integral part of the Fayetteville academic community since 1873. It develops and maintains extensive collections in archaeology, ethnography, geology, history, physical anthropology, botany and zoology. The entirety is generally available for exhibition, research, education, and/or loan. Many of the collections are more suitable as education and research tools rather than as exhibition materials. The museum exhibits only a small fraction of its collections at any one time. However, to increase exposure of its acquisitions, to provide variety and interest for viewers at various locations in the community, and to enhance area educational programs, the museum curates traveling and special exhibits with specimens not included in the regular exhibits.

The University Museum provides facilities and personnel support for specialization in anthropological museology within the master of arts (MA) degree program in anthropology. Appropriate museum collections are assembled on request for university classes in the natural and social sciences, art and classics. Museum specimens and their associated documentation are available for comparative and research purposes by university faculty, qualified students, and visiting scholars. Some museum staff members have research responsibilities in their areas of specialization, serve as guest lecturers in university courses or teach in academic departments.

The University Museum fulfills its public service and outreach mission with loans of collections to other institutions for exhibit. In addition, the museum provides consultation services to other museums, conservation advice to the public, interpretive tours for visiting groups, discovery classes for students, field trips and workshops for adults, interactive exhibits in a discovery room for school groups and general visitors, and public information services. The museum building houses exhibits, exhibit preparation shops, the Discovery Room, educational areas and administrative offices. Collection management and curatorial facilities are in Vol Walker Hall, where the research collections are housed. Research and special laboratories and the University of Arkansas Herbarium are located in the Biomass Research Center. The University Museum is a unit of the J. William Fulbright College of Arts and Sciences.

## **TESTING SERVICES**

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Testing Services is charged with the responsibility of administering standardized academic tests at the University of Arkansas. The office administers such national tests as the Medical College Admission Test (MCAT), the ACT Assessment, the Law School Admission Test (LSAT), the Graduate Management Admission Test (GMAT), the Graduate Record Examination (GRE), and CLEP exams in addition to others throughout the year. National testing companies determine testing dates and deadlines. Testing Services also offers a number of institutional tests such as TOEFL, SPEAK and the Math Placement Test. These tests are scheduled at various times as demand dictates. Test fees vary depending on the test.

To obtain a registration bulletin or information about exam dates and deadlines, please stop by 713 Hotz Hall or call (479)575-3948.





# University Centers and Research Units

Research programs are the means by which the University contributes to the generation as well as to the preservation and dissemination of knowledge. With nationally recognized programs in many areas and funding from government, industry, and other private sources, the research effort of the University is strong and diversified and provides special learning opportunities for students as discoveries are made.

In addition to the extensive work performed by faculty through individual and team efforts in academic departments, special programs of research are conducted by the University divisions described below.

## **AGRICULTURAL EXPERIMENT STATION**

The Arkansas Agricultural Experiment Station, a statewide unit of the UA Division of Agriculture, conducts scientific research on the dynamic biological, environmental, economic, and social systems involved in the production, processing, marketing, and utilization of food and fiber, community development and family studies.

The experiment station is one of the most comprehensive research organizations in Arkansas, with a faculty of approximately 200 doctoral-level scientists. It is an essential part of the research and technology infrastructure that supports Arkansas agriculture and the food and fiber sector.

Experiment station research is conducted in agricultural and environmental sciences, marketing and economics, social issues affecting families and rural communities, nutrition, microbiology, genetics, molecular biology, and other dynamic scientific disciplines.

Many experiment station scientists also are on the teaching faculty of the Dale Bumpers College of Agricultural, Food, and Life Sciences. The result is a wealth of opportunity for students to study and work with some of the nation's most respected scientists. Graduate students work on master's thesis and doctoral dissertation research projects as a part of a team of experiment station scientists in modern laboratories, greenhouses, and field research facilities.

Experiment station research is closely coordinated with the Arkansas Cooperative Extension Service. Together, they comprise the statewide UA Division of Agriculture.

The vice president for agriculture heads the division of agriculture for the UA system. The associate vice president-extension provides leadership to the cooperative extension service and reports directly to the vice president for agriculture. The dean of the Dale Bumpers College of Agricultural, Food and Life Sciences also serves as the associate vice president-research and provides leadership for the agricultural experiment station. The associate vice president-research reports directly to the vice president for agriculture for agricultural research programs and as the dean to the vice chancellor for academic affairs for instructional programs. The associate director of the experiment station also serves as an associate dean in the college and the associate dean serves as an associate director in the experiment station, respectively.

The mission of the Division of Agriculture, through the combined efforts of the Experiment Station and Extension Service, is to provide new knowledge to strengthen the state's food and fiber sector; assure a safe food supply; conserve natural resources and protect the environment; and assist in the economic and social development of communities, families, and individuals, particularly in the rural areas of the state.

## **ARKANSAS ARCHEOLOGICAL SURVEY**

The Arkansas Archeological Survey is a research and public service organization charged by the legislature with statewide responsibility for conserving and investigating the state's archeological heritage and with making information on this rich heritage available to all. To this end it has an extensive publication and public relations program. With a staff of 40 (approximately half of whom are professional archeologists), it is recognized as one of the most effective state-supported archeological research organizations in the country. The survey's coordinating office on the Fayetteville campus consists of the director, the state archeologist, computer services, editorial, graphics, and other support staff. There are also several research archeologists who carry out archeological investigations under contracts as required by law to protect the state's archeological resources. There is a station archeologist at each of 10 research stations around the state, including the Fayetteville campus, who are available for graduate guidance. The survey works closely with the University's department of anthropology in training students. It cooperates with the state historic preservation officer and other state and federal agencies and trains and assists citizen groups interested in archeological conservation. The Arkansas Archeological Survey is a separate University-wide administrative unit with the director responsible to the Board of Trustees through the system president.

## **ARKANSAS CENTER FOR ORAL AND VISUAL HISTORY**

The mission of the Arkansas Center for Oral and Visual History is to document Arkansas's rich history by collecting the "living memories" of those who have been witness to various aspects of the state's past. Using traditional oral history methodology, the center interviews individuals, transcribes those interviews, and deposits them with the Special Collection's Division of the University of Arkansas Mullins Library. The center is responsible for preserving these memories and making them available to scholars and researchers interested in the culture and heritage of Arkansas.

Contact the center at 416 Old Main, Department of History, 1 University of Arkansas, Fayetteville, AR 72701. You may call (479) 575-5895, visit the Web site at <<http://www.uark.edu/misc/arovhist/main>>, or e-mail [jwhayne@uark.edu](mailto:jwhayne@uark.edu).

## **ARKANSAS CENTER FOR TECHNOLOGY TRANSFER**

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The Arkansas Center for Technology Transfer (ACTT), founded in 1985, is the industrial outreach arm of the College of Engineering. ACTT coordinates technical efforts and forms working partnerships with Arkansas industries to improve processes and help solve technical problems. The mission of ACTT is to "increase the economic well-being of the citizens of Arkansas by providing technical assistance and training to industries of Arkansas." The specialized units described below conduct its work.

The Advanced Manufacturing Technology Laboratory works with industry to resolve problems to strengthen their competitive posture. The laboratory has experience in productivity improvement, process improvement, product development, quality control, and structural analysis. Utilizing advanced engineering tools such as finite element analysis, computer-aided design, and computer modeling/simulation, the Manufacturing Technology Lab can tackle a broad range of industrial issues.

The Applied Electronic Systems Design Laboratory employs a multidisciplinary approach to a broad base of applied and basic research topics. The laboratory's mission is to "increase the body of knowledge associated with electronic and optical systems, image processing, and digital design, through the development of advanced electronic and electro-optical systems and theories."

The Industrial Training and Multi-Media Development Laboratory specializes in the design and development of computer-based training programs for industry. Computer Based Training (CBT) combines sound, still pictures, video, animation, and graphics in a variety of customized, interactive, instructional programs. The training lab is staffed by skilled instructional designers, programmers, and graphic artists, and routinely collaborates with University faculty, and private sector experts to meet industries' changing technical training needs.

Engineering Extension Service provides short-term assistance to Arkansas businesses, industries, or local governments in seeking solutions to technical, quality, or safety problems. A full-time staff of professionals with extensive industrial experience is available to help clients throughout the entire state.

Contact information: Arkansas Center for Technology Transfer, Engineering Research Center, Research Center Blvd., Fayetteville, AR 72701. Arkansas Watts 1-800-334-3571 or (479) 575-3747, World Wide Web: <<http://actt.engr.uark.edu>>.

## **ARKANSAS COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT**

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The Coop Unit is a cooperative venture among the U.S. Geological Survey, Arkansas Game and Fish Commission, the University of Arkansas, and the Wildlife Management Institute. The Arkansas Coop Unit was established in 1988 and is part of a network of cooperative fish and wildlife research units that exist in 43 state and land-grant colleges across the United States. The purpose of the Coop Unit program is to conduct applied and basic wildlife and fish research, to train graduate students in research and management methods, and to participate in graduate education and technical assistance. The three unit leaders are federal employees stationed on the University of Arkansas Fayetteville campus.

## **ARKANSAS HOUSEHOLD RESEARCH PANEL**

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The Arkansas Household Research Panel (AHRP) is a continuing project of the department of marketing and transportation. AHRP consists of several hundred Arkansas households that respond to quarterly questionnaires. The AHRP has been used for both academic, student, and business-related research. The panel's funding comes from the professional fees that are generated.

## **ARKANSAS LEADERSHIP ACADEMY**

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The Arkansas Leadership Academy in the College of Education and Health Professions is a model program that prepares leaders for the classroom and the board room, develops accountability to communities, and facilitates the creation of results-driven educational environments. The Academy supports reform of the educational system and provides direct services to school districts through district support activities or strategic leadership institutes. Academy graduates become part of a statewide network that pursues educational reform. The network includes representatives from business, industry, state government, the public schools, and higher education. The Academy is governed by partners from higher education institutions, education service cooperatives, professional education organizations, state education agencies, foundations and corporations. The synergy created among the partners builds the expertise and capacity for Arkansas to become a true community of learners.

## **ARKANSAS – OKLAHOMA CENTER FOR SPACE AND PLANETARY SCIENCES**

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The Arkansas-Oklahoma Center for Space and Planetary Sciences links faculty and students in a number of academic departments and various colleges at the University of Arkansas and at Oklahoma State University, which share common research interests in space and the planetary sciences and require similar facilities for research. The founding departments at the University of Arkansas are chemistry/biochemistry, biological sciences, geosciences and mechanical engineering. The founding department at Oklahoma State University is physics. It is expected that new departments at both institutions soon will be added. In addition to providing facilities, the center also provides financial resources in the form of research grants and studentships. The center hosts seminars and lectures and has an advisory committee comprising a variety of professionals in the fields of space and planetary sciences. This builds a synergistic environment for colleagues in other units of the two universities who have similar interests.

Graduates from the center will be able to enter a variety of career paths in research, teaching and industrial arenas, but it is expected that many will assume careers with one of the national space programs.

A student will follow the normal admission procedures for his or her academic department, but, in addition, will be required to submit a form of introduction to the center faculty describing specific interests in space research. The form will not be used to determine suitability to any departmental program but will determine if the student is to be affiliated with the center and eligible for support by the center.

There are no additional academic requirements for the program beyond those of the department, but it is expected that the student's advisory committee will have center faculty well represented because of common interests. The normal academic requirements are given in the university, college and departmental entries in the *Catalog of Studies* and in the *Graduate School Catalog*.

The administrative offices for the center are in the Chemistry Building, Room 10; telephone (479) 575 4272, facsimile (479) 575-7778, E-mail: [csaps@uark.edu](mailto:csaps@uark.edu). See <<http://www.uark.edu/csaps>> for more information.

## **ARKANSAS SCHOOL STUDY COUNCIL**

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The Arkansas School Study Council, housed since its inception in 1960 in the College of Education and Health Professions in the Department of Educational Leadership, Counseling and Foundations, is a professional service and outreach organization devoted to the dissemination of research and opinion on major issues pertaining to Arkansas public education. Staffed by a member of the faculty, the Council's primary work in recent years has been informing school officials about equity

issues pertaining to funding for public education in Arkansas. The Council's membership includes a number of public school districts and education service cooperatives in Arkansas. It is also affiliated with the National School Development Council.

### **ARKANSAS WATER RESOURCES CENTER**

The Arkansas Water Resources Center, established by Public Law in 1964, utilizes scientific personnel and facilities of all campuses of the University (and other Arkansas colleges and universities) in maintaining a water resources research program. The center supports specific research projects throughout Arkansas, which often provide research training opportunities for undergraduate and graduate students, and disseminates information on water resources via publications and conferences. The center works closely with federal, state, municipal, educational, and other public groups concerned with water resources in development of its research, training and dissemination programs.

### **ARKANSAS WORKFORCE EDUCATION CURRICULUM CENTER**

Established in 1982 in the College of Education and Health Professions in the Department of Vocational and Adult Education, the Center is an instructional resource program associated with the Arkansas Department of Workforce Education. It provides services for educators and administrators throughout Arkansas, including curriculum and video preview and purchase, materials dissemination, workshops and in-service curriculum development activities, curriculum materials development, instructional resource searches, and free preview of curriculum materials.

### **BESSIE BOEHM MOORE CENTER FOR ECONOMIC EDUCATION**

The Bessie Boehm Moore Center for Economic Education, established in 1978, promotes an understanding of the American economy among the people of Arkansas. Its major efforts are directed to elementary and secondary school children. The center's faculty and staff hold workshops and seminars for public school teachers, conduct research in economic education, develop instructional materials, maintain a lending library, and sponsor adult economic educational programs for business, labor, industry, and the general community. In recent years, Center personnel have been involved in educating teachers in transitional or developing economies about market economics. The center is officially certified by the Arkansas Council on Economic Education and the National Council on Economic Education.

For college-level students, the Center sponsors the Walton College Students In Free Enterprise (SIFE) team. SIFE's mission provides college students the best opportunity to make a difference while developing leadership, teamwork, and communication skills through learning, practicing, and teaching the principles of free enterprise. The Walton College SIFE team welcomes members from other colleges who embrace their mission and want to grow through benefiting the local community. The UA SIFE team is quickly becoming a nationally recognized organization.

The Center is located in Suite 205 of the Don W. Reynolds Center for Enterprise behind the Business Building and may be reached by calling (479) 575-2855.

### **BIOMASS RESEARCH CENTER**

The Biomass Research Center currently houses the food safety laboratory, which includes the hybridoma laboratory, the agricultural research services laboratory, museum curatorial laboratories, and one of the entrepreneurial clients of GENESIS.

### **CENTER FOR ADVANCED SPATIAL TECHNOLOGIES**

The Center for Advanced Spatial Technologies (CAST) focuses on application of geospatial technologies in research, teaching and service. These technologies include GIS, GPS, remote sensing, photogrammetry, geospatial software and systems design, interoperability and large (multi-terabyte) geospatial data bases.

CAST was established in 1991 and is an element of the J. William Fulbright College of Arts and Sciences but has a campus-wide focus. The center has particularly close relationships with the departments of anthropology; architecture; crop, soil and environmental science; biology; bioengineering; civil engineering; geosciences; entomology, and landscape architecture. Other related partners include the Environmental Dynamics Program, the Arkansas Water Resources Research Center, Mullins Library, and the Arkansas Archeological Survey.

CAST has been selected as a Center of Excellence by the Intergraph Corporation, Trimble Navigation Inc., the Oracle Corporation, Definiens Imaging, Sun Microsystems, TerraSoft, MapInfo and PCI Geomatics. These and other corporate sponsors have provided more than \$14 million of in-kind support of the research teaching facilities of the center. The center has extensive hardware and software capabilities including more than 85 high performance workstations, five Windows XP and four Solaris servers (combined seven terabyte of on-line disk) three large format plotters, multiple scanners, many other peripherals and a very extensive inventory of software.

University of Arkansas undergraduate and graduate students have a wide range of geospatial courses available to them that utilize CAST facilities and laboratories. These courses, taken along with related courses in cartography, remote sensing, image interpretation, photogrammetry, surveying, and spatial statistics, provide the student with a range of career options. In addition to classroom instruction, CAST facilities are used by students in both undergraduate and graduate research projects. The internship program in Applied Spatial Information Technologies offers students an opportunity to gain hands-on experience in geospatial technologies.

CAST staff are engaged in research projects in a wide range of areas. A few recent research projects focused on areas such as the creation of a seamless, on-line spatial data warehouse; K-12 GIS education; soil survey by remote sensing; land-use/land-cover identification; remote sensing for historic resources; natural resources wetlands analyses; multi-sensor remote sensing for historic resources; and predicting Red Oak Borer populations.

CAST is active in a wide range of service and outreach to the university, community, state, nation, and is also active internationally. By building upon the expertise of staff; the cooperation of the university community and state, regional, and local governments; the support of corporate sponsors; the assistance of federal agencies; and many others, CAST blends its focus on education, research, and public service to multiply the benefits of all these cooperative efforts. Information about CAST can be found at [www.cast.ark.edu](http://www.cast.ark.edu).

### **CENTER FOR ARKANSAS AND REGIONAL STUDIES**

A multidisciplinary agency within the J. William Fulbright College of Arts and Sciences, the Center for Arkansas and Regional Studies encourages research, publication and dissemination of knowledge about life and culture in Arkansas and the surrounding region. The Center administers the interdisciplinary major in American Studies, and sponsors lectures, seminars, conferences, radio programs and international student exchanges. The Center also produces workshops and audio and video documentary recordings, and works with Mullins Library to locate and collect Arkansiana and other regional materials.



## **CENTER FOR BUSINESS AND ECONOMIC RESEARCH**

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The Center for Business and Economic Research (CBER) is a public service/outreach center and a student-faculty research center. An integral part of the Sam M. Walton College of Business, the CBER conducts externally sponsored research for local and state government, as well as the state business community. The staff responds daily to requests for state and local economic and demographic data.

In addition to conducting externally funded research, the CBER maintains several electronic database libraries of economic and financial information to serve the needs of students and faculty. Examples of organizations with which the CBER has been involved include the Arkansas Department of Finance and Administration, Arkansas Department of Parks and Tourism, U.S. Army Corps of Engineers, Beverly Enterprises Inc., Mercury Energy, and the Arkansas Research and Technology Park planning group.

The CBER publishes the Arkansas Business and Economic Review, a quarterly business and economics journal, which is dedicated to providing information about Arkansas' business and economic environment. The Review covers state, regional, and national business and economic issues. It includes state and regional economic indices relating to personal income, industrial output, employment, population and other factors.

The CBER is housed in room 217 of the Donald W. Reynolds Center for Enterprise Development. CBER staff can be reached by phone: (479) 575-4151, fax: (479) 575-7687, or e-mail: [cberinfo@cavern.uark.edu](mailto:cberinfo@cavern.uark.edu).

## **CENTER FOR COMMUNICATION AND MEDIA RESEARCH**

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The Center for Communication and Media Research (CCMR) advances knowledge and supports scholarly and applied inquiry into the study of interpersonal, group, organizational and media communication. Knowledge produced by the center is used to provide for intellectual exchange. The center sponsors outreach programs designed to help under-served populations, educational institutions, media companies, businesses and non-profit organizations.

The complex field of communication has exploded as liaisons between communication scholars and individuals in allied fields have formed. Specifically, the multidisciplinary character of the center seeks to facilitate scholarship among allied disciplines such as journalism, law, business, political science, psychology, sociology and computer science. Alliances such as these facilitate research in communication and advertising, dispute resolution, education, environmental concerns, family, health, information technology, legal concerns, life stages, media audiences, organizational concerns, politics and religion.

For information, contact the Center for Communication and Media Research, Department of Communication, 417 Kimpel Hall, 1 University of Arkansas, Fayetteville, AR 72701 or call (479) 575-3046.

## **CENTER FOR ENGINEERING LOGISTICS AND DISTRIBUTION (CELDi)**

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The Center for Engineering Logistics and Distribution (CELDi) is a multi-university, multi-disciplinary, National Science Foundation sponsored Industry/University Cooperative Research Center (I/UCRC). CELDi emerged in 2001 from The Logistics Institute (1994) to provide integrated solutions to logistics problems, through research related to modeling, analysis and intelligent-systems technologies. Research endeavors are driven and sponsored by representatives from a broad range of member organizations, including manufacturing, maintenance, distribution, transportation, information technology, and consulting. Partner universities include the University of Oklahoma, Oklahoma State University and the University of Louisville. This partnership among academic institutions and industry represents the effective

integration of private and public sectors to enhance a U.S. competitive edge in the global market place.

CELDi helps industry partners excel by leveraging their supply chain to achieve a distinguishable, sustainable difference. Member companies realize a measurable return on their investment by creating competitive value chains in terms of cost and service quality. Through basic research, collaborative applied research with industry, technology transfer, and education CELDi is a catalyst for developing the engineering logistics methodology necessary for logistics value chain optimization.

For more information contact the center at (479) 575-2124; FAX: (479) 575-8431, or visit the Web site at <http://celdi.ineg.uark.edu>.

## **CENTER FOR HEALTH, PERFORMANCE AND WELLNESS**

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The Center for Health, Performance and Wellness in the College of Education and Health Professions in the Department of Health Science, Kinesiology, Recreation and Dance provides comprehensive educational services as well as research-based programs for the health, optimal performance, and wellness of individuals and/or groups of employees in public and private organizations. The activities of the Center are supported through contractual agreements with agencies, hospitals, and schools as well as health and fitness programs. In addition the Center provides internships for students in a variety of settings and conducts research on health and wellness issues.

## **CENTER FOR INSTRUCTIONAL TECHNOLOGY**

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The Center for Instructional Technology in the College of Education and Health Professions was developed to meet a spectrum of technology needs in the K-12 public schools and higher education programs in Arkansas. It serves as a technology training and development center to effectively incorporate technologies into instructional practice. As a model educational technology program, the Center has the following purposes: to demonstrate educational technology in the instructional programs of the College; to link K-12 teachers and students throughout the state with the technology programs and systems at the College; to conduct outreach and courses via distance education technologies to the K-12 and higher education communities in Arkansas; to serve as a major technical assistance resource on education and technology in Arkansas; and to conduct research on educational technology issues facing the state.

## **CENTER FOR MANAGEMENT AND EXECUTIVE DEVELOPMENT**

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The Center for Management and Executive Development provides executive and middle management training opportunities designed to enhance quality in leadership, management decision making, and human resource skills and abilities for corporate and public clients. Programs provide training for implementation of current acceptable practices and approaches to problem solving that support progressive management achievements. Programs are custom designed for individual clients or they are designed in modular fashion from several pre-prepared programs to meet the general leadership needs of organizations and include such topics as customer service, leadership, team development, total quality and continuous improvement, and personal skills development.

The Center serves local, national, and multinational businesses. The Center operates on a fee for service basis, and its activities are supported from fee based revenues. The Center also provides directive support for Arkansas manufacturers who seek to produce and market products for the mass market and for its retailers through the Support Arkansas Made program. Support Arkansas Made assists manufacturers in the evaluation of new products and product ideas based upon marketable criteria.

## **CENTER FOR MATHEMATICS AND SCIENCE EDUCATION (CMASE)**

The Center for Mathematics and Science Education (CMASE) within the College of Arts and Sciences is financed through the UA Fayetteville Research Office/Graduate School. The center works in conjunction with the Arkansas Department of Higher Education (ADHE) as one part of a network of mathematics and science centers on university and college campuses around the state. The main objectives of the center are 1) to assist in statewide proposal initiatives (the collective being greater than the one), 2) to provide regionally beneficial grant-funded programs among universities and colleges for K-16+ education, 3) to provide access points for dissemination of educational materials, resources and information, and 4) to link common education allies throughout the state.

Through CMASE activities such as University Day, Science/Engineering Fairs, Springfest, and various K-12 teacher and student programs are conducted. Day-to-day educational outreach information is sent to local, regional and statewide constituencies through e-mail listservs and local, regional and statewide teacher/school/district databases.

CMASE is a host site for the federally sponsored Eisenhower National Clearinghouse (ENC) and the Southwest Educational Development Laboratory (SEDL)/SCIMAST Consortium. CMASE is now a nationally recognized ENC Access Center and a southwest, five-state, regional SEDL/SCIMAST partner. These partnerships help maintain a distribution point for "best-practices," nationally recognized science and mathematics materials, and resources within the state network of Centers as well as around the state and nation.

CMASE is also the Arkansas NASA Educator Resource Center (ERC) and is responsible for 1) warehousing and disseminating NASA materials (provided by NASA HQ in Washington, D.C. and NASA Marshall Space Flight Center in Huntsville, AL) to state educators and 2) providing regular updates on NASA programs and materials. Web pages, specifically created for NASA ERC, provide a database of all materials and information available for statewide educator access.

Contact the NASA EDUCATOR RESOURCE CENTER at 106 Ozark Hall, Fayetteville, AR 72701 or call (479) 575-3875 for information.

## **CENTER FOR MIDDLE-LEVEL EDUCATION, RESEARCH AND DEVELOPMENT**

Established in 1992, the Center for Middle-Level Education, Research and Development in the College of Education and Health Professions in the Department of Curriculum and Instruction has three main purposes: to provide technical assistance and consulting services for schools seeking to restructure as middle schools; to conduct research on middle-level education and disseminate the findings; and to provide professional development programs, including summer institutes and follow-up sessions, to middle-school educators. Center personnel conduct research and assist educators to develop research initiatives, and provide consultation for the development, evaluation, and improvement of programs at the district, middle school, or classroom levels. In addition, a clearinghouse is operated to locate, collect, develop, and disseminate resources on the educational, social, and health needs of adolescents.

## **CENTER FOR PROTEIN STRUCTURE, FUNCTION AND DYNAMICS**

The Center for Protein Structure, Function and Dynamics is an interdisciplinary unit for research and teaching within the departments of chemistry and biochemistry, and biological sciences in the Fulbright College of Arts and Sciences. The Center raises funds from federal, state, and private sources and sponsors faculty- and student-initiated basic research on the folded structures of protein molecules, their dynamic properties, and their diverse functions in biological systems. Recent

funding has been awarded from the National Science Foundation, the Arkansas Science and Technology Authority, and the National Institutes of Health. Co-directors of the Center are Frank Millett and Roger Koeppel in the department of chemistry and biochemistry (phone 575-4601).

## **CENTER FOR RETAILING EXCELLENCE**

The Center for Retailing Excellence promotes superior performance in retail practice through both research and education programs. Through its efforts, the center promotes student interest in and preparation for careers in retailing and closely related businesses. The center works to develop strategic alliances between business academics and industry by focusing on interdisciplinary issues and concerns of retailers and vendors in both its activities and research programs. By means of its initiatives and support, the center stimulates research that advances our knowledge of retailing and addresses problems faced by retailing organizations and vendor firms. The Center for Retailing Excellence provides a range of benefits for constituent groups comprised of students, retail organizations and their suppliers, and faculty researchers.

## **CENTER FOR SEMICONDUCTOR PHYSICS IN NANOSTRUCTURES (C-SPIN)**

The University of Arkansas and University of Oklahoma are equal partners in the Center for Semiconductor Physics in Nanostructures (C-SPIN). C-SPIN is funded by the National Science Foundation under the Materials Research Science and Engineering Center program, with \$4.5 million in NSF funding committed to C-SPIN over five years.

C-SPIN personnel include faculty from the physics and chemistry departments. C-SPIN students are enrolled in physics, chemistry, and microEP graduate programs and pursue studies ranging from quantum dots grown one atom at a time to colloidal nanocrystals destined to become future detectors of biological processes. In addition to the nano-science emphasis of C-SPIN, it also strongly supports K-12 outreach efforts to move the excitement of advanced research into school systems. The efforts of C-SPIN personnel in this area are designed to increase the level of science and technology competency in both Oklahoma and Arkansas. For more information, visit the C-SPIN Web site at <http://www.cspin.net>.

## **CENTER FOR SENSING TECHNOLOGY AND RESEARCH**

The Center for Sensing Technology and Research (CSTAR) is a focused effort to draw upon unique campus strengths to carry out a high-impact research program directed toward fundamental and applied research in new sensor technology. The center pursues fundamental advances in sensing technology from the conceptual to implementation stages. Drawing upon present state-of-the-art campus facilities and faculty research and engineering strengths, the center emphasizes support of competitive research in this critical area of biotechnology. It is intended that CSTAR will become an important component of the state's research infrastructure, which is essential to the continued implementation of biotechnology within Arkansas-based businesses. Thus, synergistic interaction with industrial participants within the state is anticipated, with the expectation that they will provide "real-world" applications in need of advanced sensing technology.

The investigators who are involved in the CSTAR represent a broad range of scientists and engineers with research experience ranging from fundamental chemical studies of sensor materials and principles to fabrication and utilization of sensors in practical applications. It is envisioned that the proposed center will be the vehicle for synergistic cross-disciplinary interaction of the researchers and their students, which will result in highly effective and rapid implementation of new sensors in a variety of applications. At present,



faculty from chemistry and biochemistry, chemical engineering, electrical engineering, and poultry science are participating in CSTAR research programs. In addition to present faculty participants, a new chemistry and biochemistry faculty member specializing in the field of combinatorial chemistry is currently being recruited. Addition of such an individual will permit the center research programs to more rapidly move into the important area of highly specific microsensor development, based upon developing requisition recognition functionality in synthetic materials. It is anticipated that the goal of combinatorial syntheses could well be the specific materials to be incorporated in sensors. Those would be produced in the center by researchers who have expertise in microfabrication and who are interested in the viability of highly sensitive specific microfabricated sensors.

An essential goal of the center is to contribute to the graduate education of a new generation of scientists and engineers skilled in advanced sensing technology, therefore, the center provides support for recruitment and research of qualified graduate students to the relevant doctoral programs of the participating faculty.

### **CENTER FOR THE STUDY OF REPRESENTATION — ARKANSAS POLL**

The Center for the Study of Representation (CSR) is a research center located in the department of political science at the University of Arkansas, Fayetteville. Created by the University of Arkansas Board of Trustees in 1999, the CSR is an officially recognized university research center.

The mission of the center is broadly defined in terms of scholarship and outreach related to representation, a topic that has long been the subject of theoretical discourse and empirical inquiry in the discipline of political science. In pursuit of its mission, the center performs two primary functions. First, it promotes original research by faculty and students into various aspects of political representation. Second, the center seeks to foster a wider understanding of the process of representation through its civic education programs. Lectures, symposia, speakers, television and radio appearances, and publications supported by the center contribute to public education and the development of a better informed citizenry. The centerpiece of the center's civic education program is The Arkansas Poll, a semi-annual survey of the opinions and attitudes of Arkansans on matters of politics and public policy.

The diverse aspects of the center combine to create a unique set of resources with which to study representation. However, the center is more than a set of research projects and outreach programs. It is a group of individuals sharing in a common intellectual experience who are devoted to creating an environment that promotes scholarship and interest in representative democracy.

### **CENTER OF EXCELLENCE FOR POULTRY SCIENCE**

With designation by the University of Arkansas Board of Trustees for poultry science as a center of excellence in the state's university system, the department of poultry science became a reality in 1992.

The Center of Excellence for Poultry Science (CEPS) is comprised of full-time poultry science faculty members, full-time USDA/ARS Poultry Research Group faculty members, graduate assistants, adjunct faculty and poultry science departmental staff. CEPS receives multidisciplinary contributions from several university departments including animal science; biological and agricultural engineering; biological sciences; crop, soil, and environmental sciences; entomology; food science; industrial engineering; the School of Human and Environmental Sciences and the UALR College of Pharmacy.

The department of poultry science and the research group are housed in the John W. Tyson Building, which is a 112,000-square-foot, state-of-the-art laboratory and office complex that was completed the fall of 1995

on the UA campus. In addition to the John W. Tyson Building on the main campus, CEPS is comprised of the following facilities:

- FDA-licensed feed mill;
- 10,000-square-foot processing plant used for teaching processing techniques and for ongoing food safety research projects;
- 12,000-square-foot John Kirkpatrick Skeeles Poultry Health Laboratory, which holds the highest bio-safety rating (P3) available in the country;
- a poultry research farm facility including hatchery, genetics unit, pullet rearing facility, battery brooder, caged layer house, broiler breeder houses and turkey houses; and,
- four full-sized broiler houses equipped with computerized environmental control and data collection systems capable of commercial-type production research.

By majoring in poultry science, students are provided a scientific as well as a technical education preparing them for positions of leadership and responsibility in the expanding fields of poultry processing, marketing and production, breeding and genetics, nutrition, physiology, poultry health, poultry business management and food science.

Students in poultry science may also meet all pre-veterinary and pre-medical requirements necessary for entry into those professional areas.

### **DELTA RESEARCH AND DESIGN CENTER**

See University of Arkansas Community Design Center.

### **DEPARTMENT OF REHABILITATION EDUCATION AND RESEARCH**

#### **Regional Continuing Education Center in Rehabilitation**

Established in 1974, this center provides human resource development programming for personnel employed in rehabilitation programs funded by the Rehabilitation Act. These programs include state vocational rehabilitation agencies, independent living centers, community rehabilitation programs, client assistance programs and projects with industries in the states of Arkansas, Louisiana, New Mexico, Oklahoma and Texas. The center is located in the Hot Springs Rehabilitation Center, Hot Springs, Arkansas.

#### **Rehabilitation Research and Training Center for People Who are Deaf or Hard of Hearing**

Established in 1981, this national center conducts research and training programs to enhance rehabilitation efforts on behalf of the 24 million U.S. citizens who are deaf or hard of hearing. These programmatic efforts are directed toward enhancing the career preparation, job entry and placement, career advancement and workplace communication accommodations consistent with the Americans with Disabilities Act. The center is located in Little Rock and also operates two graduate training programs in deafness rehabilitation at that location.

### **DIANE BLAIR CENTER FOR THE STUDY OF SOUTHERN POLITICS AND SOCIETY**

The Blair Center is an umbrella organization supporting research and study of Southern politics. The center supports the Arkansas Poll, graduate students studying topics relevant to the South, conferences and periodic speakers discussing issues relevant to Southern politics and society.

### **ENGINEERING EXPERIMENT STATION**

Research is a major function of each of the faculties within the seven departments in the College of Engineering. Research coordination is achieved through the Engineering Experiment Station, which was estab-

lished for that purpose by an act of the Arkansas Legislature in 1920.

The overall goal of research in the College of Engineering is to provide engineering solutions to important problems that face our society. We utilize our faculty, staff, students, and facilities to enhance the well-being of both public and private sectors. Student involvement in research is especially important in that it helps link them to the needs of their future employers. All departments — biological and agricultural, chemical, civil, computer engineering, electrical, industrial, and mechanical engineering — conduct research over a broad spectrum of subjects that includes areas such as biological and chemical processes; electronics manufacturing; environmental and ecosystems analysis; material and manufacturing; software and telecommunications; and transportation, logistics and infrastructure. Funding for research within the college comes primarily through grants received from government and industry sources.

### **ENGINEERING RESEARCH CENTER**

The Engineering Research Center provides the facilities and support services for a wide variety of research activities of the College of Engineering. The center houses the Engineering Experiment Station through which the research of individual departments of the college is handled, the Genesis Technology Incubator program, the Southwestern Regional Calibration Center, the High Density Electronics Center, the Arkansas Center for Technology Transfer, the Industrial Training Laboratory, the Center for Interactive Technology, the Systems Technology Laboratory, the Highway Construction Materials Laboratory, the Hydrology Laboratory, the Low-Speed Wind Tunnel Laboratory and the engineering extension office.

The center is located in a modern 186,000-square-foot facility on 32 acres located approximately two miles south of the main campus in Fayetteville.

### **FAMILY AND COMMUNITY INSTITUTE (THE)**

The Family and Community Institute is a joint effort of the University of Arkansas and the Harvey and Bernice Jones Center for Families. The Institute is a multidisciplinary research center in the Fulbright College of Arts and Sciences that conducts basic and applied research, as well as policy related studies on the critical issues facing families and communities in the region and the nation. The Institute raises funds from federal, state, and private sources and sponsors applied research by faculty and students on the family and the community. For further information, visit the Web at <[http://www.uark.edu/depts/social/jones\\_center.htm](http://www.uark.edu/depts/social/jones_center.htm)>.

### **FULBRIGHT INSTITUTE OF INTERNATIONAL RELATIONS**

An interdisciplinary unit within the J. William Fulbright College of Arts and Sciences, the Fulbright Institute of International Relations encourages student and faculty research and scholarly analysis of foreign policy and international affairs.

The institute sponsors instructional activities, conferences, seminars, public events, and publications, including a major spring symposium on a significant topic in international affairs. The institute—a center for scholars and researchers from around the world—also sponsors a visiting fellows program, which brings national and international scholars, journalists, and professionals to campus.

The undergraduate international relations major is based in the institute, and there are five associated area studies programs. The institute's office of Study Abroad and International Exchange coordinates a number of overseas programs and provides support services for students interested in study abroad. In conjunction with Mullins Library, the institute also oversees the papers of J. William Fulbright, longest-serving chairman of the Senate Foreign Relations Committee.

### **GARVAN WOODLAND GARDENS**

Garvan Woodland Gardens is the botanic garden of the University of Arkansas, established in 1993 by an endowment of Mrs. Verna C. Garvan. Her vision is the foundation of the Garden's mission to serve the public and provide teaching and research opportunities for the Department of Landscape Architecture and the School of Architecture.

As early as 1985, the Department of Landscape Architecture was utilizing portions of the 210 acres on Lake Hamilton, in Hot Springs, Ark., as a resource to teach local ecology and design principles. Teaching opportunities continue in these areas and currently feature urban forestry, wetland ecology, construction methods and materials, design implementation, and horticulture. Two designed features offer case studies for landscape architecture and architecture students, as well as professionals: the Asiatic Garden by nationally recognized Asiatic garden designer David Slawson and the Verna C. Garvan Pavilion by internationally recognized architects Fay Jones and Maurice Jennings.

Research opportunities lie in wetland ecology and constructed wetland design, sustainable design, and therapeutic gardens. On-going public programs feature workshops on gardening techniques, bonsai collections, and perennials.

An annual symposium focuses on timely issues affecting the quality of life of people in Arkansas and the nation. Past topics include historic landscape preservation practice in Arkansas and livable and sustainable community development.

Garvan Woodland Garden is a member of the American Association of Botanical Gardens and Arboreta.

### **GENESIS TECHNOLOGY INCUBATOR**

GENESIS provides technology-based companies with research and development support by allowing these firms access to university labs and facilities as well as technical support from university researchers. Firms accepted into GENESIS are provided physical space in university research centers as well as office space, shared support services, and both business and technical guidance. GENESIS' goal is that of creating jobs for Arkansans skilled in the science and engineering professions as well as helping to diversify both Arkansas' technology and economic base. Applicants must meet strict technical guidelines as determined by a committee of university researchers, administrators, and a 15-member advisory board comprised of community business leaders. GENESIS was conceived to span all university colleges and departments by providing entrepreneurs needing research and development support a method for obtaining and coordinating the same through a program which focuses the resources of the entire campus for this common objective.

### **GREAT EXPECTATIONS OF ARKANSAS**

Great Expectations of Arkansas, based in the College of Education and Health Professions, prepares teachers and administrators to create classroom change through effective environments in which academic, attitudinal and behavioral outcomes are attained in keeping with high standards for achievement. Encouraging group work and confidence building, Great Expectations students are involved in classrooms in which they can learn regardless of their background. The mission of Great Expectations is to provide a supportive learning environment based on core beliefs that will allow every student in participating schools to experience high degrees of success. The program delivers specialized institutes and follow-up services for teachers throughout the state.

### **HEALTH EDUCATION PROJECTS OFFICE**

The Health Education Projects Office in the College of Education and Health Professions in the Department of Health Science, Kinesiology, Recreation and Dance serves schools and communities to assist them in

the delivery of effective health education programs. In addition to ongoing research in selected health education areas, the Office has developed health education programs and interventions to foster effective education of children and youth. In addition, the Office provides professional development for teachers and other educators, assists with program implementation, and consults on health education projects. The Office has specialized in abstinence education, substance use prevention, tobacco use prevention, rural health education, and HIV/AIDS education.

### **HIGH DENSITY ELECTRONICS CENTER**

The High Density Electronics Center (HiDEC) was established in 1991 as an interdisciplinary research program in advanced electronic packaging technologies, particularly the rapidly developing technology of multichip modules (MCMs), which allow electronic systems to be small, fast and cheap.

With generous support from the Defense Advanced Research Projects Agency (DARPA), a large clean room was constructed and an MCM fabrication facility, unique among universities, was installed. Current research programs focus on 3-D electronic packaging, high density laminate substrates, cofired ceramic substrates for wireless applications, high temperature superconducting (HTSC) tunable filters, micro electro-mechanical systems (MEMS), and integrated passives development. The program involves faculty from six departments and more than 25 graduate students. Continuing funding comes from DARPA and several industrial sponsors. Significant national recognition has resulted from work performed at HiDEC.

### **HUMAN PERFORMANCE LABORATORY**

The Human Performance Laboratory in the College of Education and Health Professions in the Department of Health Science, Kinesiology, Recreation and Dance has a dual-purpose mission: educational outreach and research programs for targeted populations. The program is committed to the pursuit of knowledge about the health and well-being of people through research, research dissemination, outreach, and service. Known for an emphasis on fitness, the program provides an opportunity for the faculty to conduct ongoing research and service programs.

### **INFORMATION TECHNOLOGY RESEARCH CENTER**

The Information Technology Research Center (ITRC) is an interdisciplinary unit for research within the Sam M. Walton College of Business. The mission of the ITRC is to advance the state of research and practice in the development and use of information technology for enhancing the performance of individuals and organizations; provide a forum for multidisciplinary work on issues related to information technology; promote student interest in the study of information technology; and facilitate the exchange of information between the academic and business communities. The ITRC was established by a grant from the Walton Family Charitable Support Foundation.

### **INSTITUTE OF FOOD SCIENCE AND ENGINEERING**

The Institute of Food Science and Engineering and its three technology centers grew from the commitment of the University of Arkansas Division of Agriculture to finding creative ways to bring its expertise and resources to bear on specific problems and issues that affect productivity and growth in the food processing industry, with the mission of strengthening that critical component of the agricultural sector and the entire economy.

The institute assists industry by fostering cooperative, multidisciplinary efforts that provide research to solve problems, technology transfer to put new information to work, and education in skills needed by specific industries. Alliances between the institute and private industry devise solutions to identified problems. This demand-driven ap-

proach assures a direct, positive impact on the value-added processing of food products.

The Center for Food Processing and Engineering's primary objective is to facilitate research leading to value-added products and improving the efficiency and effectiveness of the processing of agricultural products. Activities of the Center for Food Safety and Quality seek to maintain or improve the safety of foods through production, harvest, processing, distribution and storage. The main thrust of the Center for Human Nutrition is to develop new value-added functional foods with elevated levels of health promoting compounds and ways to motivate people to include generous amounts of these foods in their daily diets. These efforts will assure food safety and improve the sensory and nutritional quality of food to meet the nutritional requirements and food preferences of a changing society.

The offices of the Institute of Food Science and Engineering are located in the Food Science Building at the Arkansas Agricultural Research and Extension Center. Visit us on the World Wide Web at <http://www.uark.edu/depts/ifse/> or by phone (479) 575-4040.

### **INTERNATIONAL CENTER FOR THE STUDY OF EARLY ASIAN AND MIDDLE EASTERN MUSICS**

The International Center for the Study of Early Asian and Middle Eastern Musics, established in Spring 2000 following two major gifts from alumni George and Joyce Billingsley and the Stella Boyle Smith Trust, is a research center located in the Department of Music, J. William Fulbright College of Arts and Sciences.

The Center co-ordinates the international Tang Music Project and is linked with the Ancient Asian Music Preservation Project of the Library of Congress, a co-operation that includes internships at the Library and an acquisitions program. The Center also functions as the base for graduate training in historical ethnomusicology and related fields, specifically tailored toward early documented repertoires of ritual- and art-music and present day performance practices in historically significant musical traditions of Asia and the Middle East. The recovery and bringing-to-life of Early Asian Musics in performance and the design of music-centered algorithms and their implementation in computer programs for editing and analysis of notated and orally-transmitted musics are central aspects of the Center's research and teaching activities. The Center works closely with both the Department of Music and the King Fahd Center for Middle East and Islamic Studies in sponsoring lectures, seminars, concerts and workshops, and collaborates in the development of international scholarly and institutional links, and of student and performing-artist exchanges.

### **KING FAHD CENTER FOR MIDDLE EAST AND ISLAMIC STUDIES (THE)**

The King Fahd Center for Middle East and Islamic Studies is an academic and research unit of Fulbright College of Arts and Sciences. It is an interdisciplinary and interdepartmental area studies center that offers diverse cultural, intellectual, and educational opportunities for the University of Arkansas community. Its functions include the promotion of research and teaching in Interdisciplinary Middle East Studies and Global Islamic Studies.

Through the King Fahd Middle East Studies Program (MEST), the center offers an undergraduate major in Middle East Studies and supports graduate studies in Middle East-related departments and programs. Middle East Studies majors of superior ability may apply for MEST scholarships to help fund their studies. The Center also supports summer language study and research for graduate and undergraduate students, and teaching and research by visiting scholars from affiliated universities and programs.

Through its core faculty, the Center coordinates with university departments to offer a full range of Middle East courses, supports facul-



ty research in Middle East and Islamic studies, engages in outreach activities, and supports an ambitious program of visiting speakers and workshops. The King Fahd Center currently maintains relationships with universities in Saudi Arabia, Morocco, Tunisia, and Russia. The Center also cooperates with the Aga Khan Humanities Program in Central Asia, the Middle East Institute in Washington, D.C., and the Elijah Center for the Study of Wisdom in World Religions in Jerusalem.

### **MACK-BLACKWELL NATIONAL RURAL TRANSPORTATION STUDY CENTER**

The Mack-Blackwell National Rural Transportation Study Center (MBTC) was established by a grant from the U.S. Department of Transportation to provide educational opportunities and conduct research in the area of rural transportation. Additional support is received from the Arkansas Highway and Transportation Department.

The broad objective of the center is to improve the quality of life in rural areas through transportation. The educational objective is to provide graduates qualified to enter the transportation-related professions with the diversity of backgrounds needed to lead transportation development into the 21<sup>st</sup> century. Although housed within the department of civil engineering, MBTC's activities are not limited to engineering. All disciplines related to or impacted by transportation participate in MBTC research and educational activities.

### **NATIONAL CENTER FOR AGRICULTURAL LAW RESEARCH AND INFORMATION**

The National Center for Agricultural Law Research and Information is a federally funded agricultural law research and information center located at the University of Arkansas School of Law. Created in 1987, the center fulfills its mission by conducting and sponsoring objective and authoritative agricultural law research and by providing bibliographic and other resources on agricultural law.

The center works closely with the UA School of Law Graduate Program in Agricultural Law, an academic program that awards the Master of Laws degree in Agricultural Law. Selected students in the graduate program serve as research fellows at the center during their residency in the graduate program.

The center is the only one of its kind in the United States and has received national recognition. It recently enhanced its national reach by establishing a collaborative relationship with the Agricultural Law Center at Drake University School of Law in Des Moines, Iowa.

Publications and research assistance are available in print and through the Web site at <[www.NationalAgLawCenter.org](http://www.NationalAgLawCenter.org)>.

### **NATIONAL CONSORTIUM FOR RURAL GEOSPATIAL INNOVATIONS (RGIS – MIDSOUTH)**

RGIS-Mid-South is one of eight regional centers throughout the United States whose mission is to eliminate the digital divide facing rural America by promoting the transfer of geospatial technologies to under-served rural areas. RGIS-Mid-South is co-located with and has been an integral part of the Center for Advanced Spatial Technologies (CAST) since 1991. The association of RGIS with CAST has been highly beneficial to both.

The RGIS program assists state, tribal, regional and local governments, and non- and for-profit organizations in implementing advanced geospatial information technologies with a particular emphasis on rural, underserved groups and communities. The goal is to improve the quality of life, environmental health, and economic competitiveness of rural communities. RGIS helps those in rural areas to implement and apply geospatial technologies to the many land use, resource protection, and economic development decisions involved in creating sustainable rural communities. Other RGIS locations include University of Wisconsin-

Madison, Penn State University, University of North Dakota, Southwestern Indian Polytechnic Institute, Central Washington University, Wilkes University and South Georgia Regional Development Center. RGIS uses a variety of approaches to make geospatial technologies understandable, affordable, and useful. These approaches include technical assistance in system development and management; locally relevant training programs including K-12 education, short courses, and university curricula; demonstration and prototype projects, including proof-of-concept and cost/benefit evaluation; data development, integration, and access mechanisms for all levels of government; and advanced spatial analyses for decision-making processes.

The RGIS mission has resulted in extensive ties with state, county, and local government agencies, and the resources available through CAST have greatly enhanced the RGIS teaching public service programs. The benefits of RGIS include access to technical expertise from a number of fields, more coordinated support for expanded communications networks (both among departments and in the state and region), and formal agreements to share in the acquisition, accessing, and cataloging of new digital data for use in research.

### **NORTHWEST ARKANSAS WRITING PROJECT**

Established in 1997, the Northwest Arkansas Writing Project is affiliated with the National Writing Project at the University of California, Berkeley. Based in the College of Education and Health Professions in the Department of Curriculum and Instruction, the Project involves teachers in workshops and institutes to prepare them to be creative and effective in their classroom writing programs. The Project supports collaborative efforts with the public schools to enhance the teaching of writing, extend the uses of writing in the curriculum, and foster the professional development of teachers. Project institutes enable teachers to develop relationships with fellow teachers to create communities of professionals focused on the improvement of writing by students in K-12 schools and at the college level. During the school year, institute graduates attend follow-up sessions, provide workshops in local schools, and serve as resources in their communities. Kidswrite, a companion program for children, provides a summer experience for the exploration of writing and guided practice through the writing of poems, plays, short stories, songs and newsletters.

### **OAK RIDGE ASSOCIATED UNIVERSITIES**

Since 1948, students and faculty of the University of Arkansas have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 85 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, post-graduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students may participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the *ORISE Catalog of Education and Training Programs*, which is available on the World Wide Web at <<http://>

[www.ora.uark.edu/orise/resgd.htm](http://www.ora.uark.edu/orise/resgd.htm), or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research, support programs and services to chief research officers.

For more information about ORAU and its programs, contact Collis R. Geren, Dean of the Graduate School and Vice Provost for Research, and ORAU Council member at 479-575-5901; contact Angie Smith at ORAU at 865-576-3146 or E-mail, [smitha@ora.uark.edu](mailto:smitha@ora.uark.edu); or the ORAU website at <http://www.ora.uark.edu>.

### **OFFICE FOR STUDIES ON AGING**

The Office for Studies on Aging in the College of Education and Health Professions was established in August 1999 to coordinate the resources of the University in addressing the needs of the aging population in Arkansas and beyond. The Office was developed to be the center for research and study of the physical, social and psychological aspects of the aging process drawing on a host of disciplines across campus. The Office conducts research, provides services, and acts as an interface between the University and the variety of service modalities for the aging population. Initial efforts of the Office are directed toward a variety of issues facing older Americans to provide meaningful solutions so that the process of aging is a positive experience, both emotionally and physically.

### **OFFICE OF RESEARCH, MEASUREMENT AND EVALUATION**

The Office of Research, Measurement and Evaluation, organized in 1998, is a research and service unit in the College of Education and Health Professions in the Department of Educational Leadership, Counseling and Foundations. Its mission includes the analysis and dissemination of data to facilitate school improvement and reform in Arkansas. The faculty and staff of the Office offer expertise in the areas of educational statistics, test and measurement theory, research design, standardized assessment, program evaluation and policy analysis. The mission of the Office is to conduct targeted educational research, drawing on the talents of faculty from several disciplines. The research conducted through the Office addresses significant issues affecting the educators and students of the public schools of the state.

### **SMALL BUSINESS DEVELOPMENT CENTER**

The Small Business Development Center (SBDC) provides small business consulting and technical assistance to the business community of northwest Arkansas. The SBDC serves as the focal point for linking together resources of the federal, state and local governments with resources of the University, the Sam M. Walton College of Business and the private sector. These resources are utilized to counsel and train small businesses in resolving organizational, financial, marketing, technical and other problems they might encounter. The SBDC offers free consulting services to small business clients. Seminars for small businesses are offered on a wide range of topics. Small Business Administration publications, other relevant small business publications, and internet access is available for small business owners in the SBDC resource center.

### **SOUTHWEST RADIATION CALIBRATION CENTER**

The Southwest Radiation Calibration Center (SRCC) provides services for neutron radiation survey equipment that requires periodic calibration. Since 1983 the SRCC has provided an expanding range of

calibration services to a large number of clients around the United States including federal and state agencies, nuclear power stations, universities with research reactors or radiation research programs, oil exploration drilling companies and nuclear medicine centers.

SRCC Services include NIST-traceable, D 2 O-moderated Californium-252 calibrations of virtually any neutron survey instruments used for radiation protection purposes. The calibrations are offered in two types: Type 1 - Calibration consists of radiation measurements at six points on one decade scale for digital instruments. For analog instruments, this is followed by electronic calibration of the remaining scales via detector sensitivity. Type 2 - Calibrations consist of radiation measurements at two points per scale on 2-4 scales per instrument. This type is mainly for non-autorange instruments.

In addition, other services include NIST-traceable irradiation of personal neutron radiation monitoring badges or electronic cumulative monitors (chirpers), including TLDs and all other types. Delivered dose equivalents offered are from 50 mrem to 5 rem on a neutron phantom per ANSI N13.11. Stated accuracy is to within  $\pm 5$  percent. Full documentation, including calibration certificate and calibration sticker showing correction factor, sources used, optional next calibration date, current calibration date, person(s) calibrating the instrument, and instrument identification.

The Southwest Radiation Calibration Center is located in the UA Engineering Research Center complex and may be reviewed on the World Wide Web at <http://enr.uark.edu/enr/enrc/srcc.html>.

### **SPEECH AND HEARING CLINIC**

The Speech and Hearing Clinic in the College of Education and Health Professions in the Department of Rehabilitation Education and Research provides evaluation, treatment, on-site consultation in schools and homes, and small group therapy services. The clinic offers evaluation and treatment for children and adults in the areas of hearing loss, central auditory processing, articulation, fluency, voice, language, augmentative and alternative communication, swallowing, and spoken English for foreign speakers. These services are provided by graduate students in the program under the direct supervision of audiologists and speech-language pathologists on the program faculty. It continues to expand its reputation as a regional center for services in augmentative communications and assistive technology.

### **SUPPLY CHAIN MANAGEMENT RESEARCH CENTER**

The Supply Chain Management Research Center (SCMRC) at the UA Sam M. Walton College of Business, sponsors and promotes supply chain, logistics, and transportation research and education. We view the supply chain as the channel that integrates business processes from suppliers through end users, providing value-added products, services, and information. Supply chain management incorporates both inter and intra company logistics, transportation, and management systems.

We undertake research and training in all aspects of the supply chain. We have sponsored research on VMI, trained salespersons and developed MRP systems, and simulated supply chains for logistics executives. The SCMRC has a broad range of interests and capabilities and has close ties to and cooperative programs within the Walton College (e.g., Center for Retail Excellence, Information Technology Research Center) and with other centers at the U of A (e.g., The Logistics Institute in the UA College of Engineering). The SCMRC is unique in that our capabilities span the technical and managerial arenas of supply chain management.

The SCMRC's Board of Directors includes representatives of firms such as ABF Freight Systems, American Freightways, Colgate-Palmolive, Federal Express, J.B. Hunt Transport, Pillsbury, Sunbeam, Tyson Foods, Unilever HPC, and Wal-Mart. The Board of Directors, along with notable supply chain professionals from business and academia, meet



annually to discuss the state of the art in supply chain management and to provide advice and direction for the center.

For additional information about the Supply Chain Management Research Center at the Sam M. Walton College of Business contact the center at 479.575.2536 or FAX: 479.575.4173.

## **SURVEY RESEARCH CENTER**

The Survey Research Center promotes faculty social science research in varied fields including those in agriculture, arts and sciences, education and athletics. By conducting surveys, the center can enhance administrative decision-making. Furthermore, the Survey Research Center provides technical consultation. With University responsibilities, the center reports to the associate vice chancellor for research. The level of service ranges from consultation on proposals through total research design. Included are survey development, sample design and sampling, data collection, data coding, text entry and verification, analysis, report writing and presentation of results. The center conducts a variety of types of surveys including but not limited to computer-assisted telephone, mail, e-mail, and person-to-person as well as focus groups. Bringing together interdisciplinary teams of researchers for collaborative work is an aim. Students employed part-time in the center receive instruction in survey methods and microcomputer applications. The center operates on a fee-for-service basis.

## **UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER**

The School of Architecture provides public service opportunities through the **University of Arkansas Community Design Center** (UACDC), founded in 1995. Initially funded by the Harvey and Bernice Jones Charitable Trust, the Center is currently supported by grants from the Winthrop Rockefeller Foundation and the Donald W. Reynolds Foundation. UACDC is a participant in the University's doctoral program in public policy, and economic analysis for UACDC projects is provided by the UA Center for Business and Economic Research (CBER).

During the fall and spring academic semesters, UACDC undertakes two or three projects from communities throughout the state. Undergraduates in architecture and landscape architecture earn studio credits while performing valuable public service. Graduate students in public policy, economics, and law assist these students in the preparation of community plans and recommendations for civic improvements. The work provides students with the opportunity to work directly with state and local citizens and leaders to gain a firsthand understanding of real world situations and conditions.

The summer workshop program provides the opportunity to live and work in selected small towns in Arkansas. Students and faculty spend up to eight weeks in a downtown setting preparing inventory, analysis and proposals for civic improvements and community planning. The Center has conducted summer workshops in Paris, Camden, Warren, Mansfield, Cotter, Piggott, Arkadelphia, Prescott, and Marianna.

Formed in November 2001 and supported by a grant of the Winthrop Rockefeller Foundation, the **Delta Research and Design Center** (DRDC) functions as a branch of UACDC. Located in Clarendon, the DRDC will assist towns and cities to develop plans and programs for physical, economic, educational, and social regeneration. Targeted

beneficiaries of the proposed center are residents and businesses in Arkansas Delta communities, where national and state prosperity has been bypassed.

Many of the projects undertaken by UACDC have resulted in practical outcomes. In the City of Hot Springs, the yearlong study of downtown parking conditions resulted in a Federal grant of \$5,000,000 for a new parking structure. A downtown study carried out for the City of Fayetteville resulted in a \$4.5 million transportation allocation for street improvements. ISTE and T 21 grants were obtained for Warren, Piggott, and Bentonville, through the efforts of the Center. The work is both academically challenging and of great practical value to the many communities served throughout Arkansas.

Interested individuals should visit the UACDC on the World Wide Web at <<http://www.uark.edu/depts/uacdc>>.

## **UNIVERSITY OF ARKANSAS ECONOMIC DEVELOPMENT INSTITUTE**

The University of Arkansas Economic Development Institute (UAEDI) was established in 2002 to promote individual and community prosperity and well-being in Arkansas by helping extend suitable UA programs throughout the state in partnership with others having similar interests. Composed of university faculty, staff and students, UAEDI is about preparing people for prosperity.

UAEDI endeavors to create an upward movement of well-being by bolstering the people to a prosperity spiral that sequentially links people, partners, power, programs, proposals, projects and prosperity in the following manner:

*People* – by addressing the needs of people for community, business, industrial, educational and leadership development through comprehensive partnerships.

*Partners* – by facilitating synergistic partnerships among the University of Arkansas and others including K-12 schools, community colleges, other universities, foundations, civic groups, businesses and industry, elected officials and other leaders, and local, state, federal and international organizations.

*Power* – by harnessing the power of UA programs to discover, develop and deliver knowledge to the state and the world through programmatic expertise in areas related to health, learning, information, environment, technology, management and culture.

*Programs* – by utilizing the University's infrastructure, including centers, laboratories, other collaborative efforts and facilities, to develop outstanding programs and proposals.

*Proposals* – by developing creative innovative quality proposals that lead to funded projects.

*Projects* – by successfully executing projects that promote prosperity and well-being in the state through community, business, industrial, educational and leadership development.

*Prosperity* – by leveraging resources to further develop the physical and intellectual capital that leads to an upward spiral of economic and social well-being and prosperity for the people of Arkansas.

For more information about the University of Arkansas Economic Development Institute, contact Director, UAEDI, 226 Engineering Hall, University of Arkansas, Fayetteville, AR 72701, (479) 575-5118, Fax: (479) 575-2412; e-mail: [ojl@uark.edu](mailto:ojl@uark.edu); Web: <<http://uaedi.uark.edu>>.



# Student Affairs

## Vision Statement

The Division of Student Affairs enhances the University of Arkansas experience by helping students to become intellectually engaged, more self-aware and strongly bonded to the University.

## Mission Statement

The Division of Student Affairs' mission is to provide programs and services to promote academic success and development.

## Core Values

- Act as partners and collaborators in all endeavors.
- Exercise our role as educators in the student learning process.
- Provide friendly, helpful and responsive service.
- Treat all individuals with dignity and respect.
- Preserve the highest ethical standards based on trust, honesty, and integrity.
- Encourage and model civility in all relationships.
- Be an inclusive community.

The Vice Chancellor for Student Affairs administers the departments of the Division of Student Affairs and provides leadership in the development of programs and services that supplement the classroom experience of students and enrich the quality of campus life. The Vice Chancellor provides a liaison to other administrative offices, faculty, and student governing groups. The office serves as a central source of information concerning University policies and procedures affecting student life and co-curricular programs and services.

Students are encouraged to bring their concerns, questions, and ideas to the attention of the Vice Chancellor or the Dean of Students.

The Dean of Students offers a wide variety of educational programming, as well as advising and referral services for individual students and many student organizations. Programs and services are developed to meet the needs of the campus community. Recognizing a diverse and changing student population, the staff works with faculty and University personnel to provide the best possible experience for all students.

## STUDENT SERVICES

### Enhanced Learning Center

The mission of the Enhanced Learning Center (ELC) is to assist the University of Arkansas (UA) in achieving its commitment to recruit, retain, and graduate more students. The purpose of the ELC is to provide a centralized, university-wide, comprehensive academic support center. The ELC will provide tutoring in variety of first- and second-year courses, as well as, supplemental instruction, study-skills education, individualized educational planning, math and writing resources,

and one-on-one academic counseling. Services offered at the ELC will be available to ALL UA students.

Programs in the ELC will include: Student Support Services, Commuter and Non-Traditional Student Services, the Quality Writing Center, and the Math Resource Center.

The ELC is projected to open by fall 2003. The center will be on the ground floor of Gregson Hall, and will feature two state-of-the-art computer labs, laptop checkouts, an open-study area, glassed-in study rooms, a conference room, and staff offices. Our hours of operation will be from 8 AM to 10 PM Monday through Thursday, 8 AM to 5 PM on Friday, and 5 PM to 10 PM on Sunday.

### Services for Non-Traditional and Commuter Students

Increasing numbers of non-traditional students are attending the University. A non-traditional student is defined as an undergraduate who is 25 years of age or older, is enrolled part-time, is financially independent, has interrupted his or her education, works or has worked full-time, is married, or is a parent or has dependents. Recent figures indicate that approximately 20 percent of undergraduate students at the University of Arkansas are 25 years of age or older. The mission of the office for Non-Traditional & Commuter Students is to provide prospective and currently enrolled non-traditional and commuter students with support, services, information, and resources to meet their unique needs. The office will assist individuals with problem solving and provide information and referrals. For more information, visit the Arkansas Union, Room A680, telephone (479) 575-7351, or e-mail [onts@uark.edu](mailto:onts@uark.edu).

In addition, several Student Affairs areas provide programs for older students. Orientation has two summer sessions for transfer and adult students. Campus Dining Services offer individual meals or meal ticket programs for off-campus students. Career Services has extended office hours beyond 4:30 PM. Counseling and Psychological Services (CAPS) provides a number of workshops and support groups designed to meet the special needs of adult learners. Information on childcare services is available from the office for Non-Traditional & Commuter Students.

### Student Support Services

Student Support Services is available to students who need academic or counseling support to successfully pursue a college degree. Services include assistance in securing financial aid, tutoring, wellness counseling, cultural enrichment opportunities, and college survival skills training. Students' needs are determined by an interview with a counselor and a personal career-abilities assessment. To qualify for the program, a student needs to be either the first generation in a family in which neither parent has completed a four-year college degree, have low-income qualifications, have a documented disability, or any combination of the three. For more information, call (479) 575-3546 or come by Darby in

Walton Hall, directly behind the parking garage adjacent to the Arkansas Student Union.

### Services for International Students

The Office of International Students and Scholars serves foreign students and scholars and enhances the global awareness of the UA community. The office provides pre-arrival assistance and a comprehensive orientation program for newly admitted international students each semester. Cross Cultural Mentors provide one-on-one contact and group activities for new international students during their first semester, assisting them in their adjustment to the academic community and the Fayetteville/Northwest Arkansas area. The office provides services such as immigration advising, employment authorization, non-resident tax filing assistance, and other programs and services that help students and scholars reach their academic and personal goals and make their time at the University of Arkansas more productive and enjoyable.

The office administers four outreach programs that give students an opportunity to learn about U.S. life and culture while enriching the community's knowledge and appreciation of diverse populations and cultures. These are: the Friendship Partner program, which pairs students with a local families who share American culture, daily life, and special activities with students; the Conversation Club program, which provides students with a small-group setting in which to practice conversational English with native speakers; the International Culture Team, a group whose members speak or share other skills and talents through presentations at community organizations, representing their home countries and cultures; and the Spouses Program, which brings together spouses of students and scholars to build friendships and introduce resources in the community that would benefit them.

The office sponsors various events including: the celebration of International Education Week each fall, yearly seminars for immigration attorneys, and an International Student Support Group each semester. A number of registered student organizations specific to various country, culture, or language groups are linked with the office including the International Students' Organization (ISO), a group for U.S. and international students, which organizes events such as the International Bazaar and an annual banquet.

The Office of International Students and Scholars is in Holcombe Hall, Room 104; phone (479) 575-5003; FAX (479) 575-7084; e-mail: [iss@uark.edu](mailto:iss@uark.edu); Internet [www.uark.edu/iss](http://www.uark.edu/iss).

### Office of Student Mediation and Conflict Resolution

The Office of Student Mediation and Conflict Resolution came into being in Fall 2002. It provides an informal, timely, impartial, and confidential means of conflict resolution to students and the campus community. It is the goal of the office to foster a culture of community, safe and open dialogue, and encourage cooperative problem resolution. If you contact their office to address a specific conflict, they will: listen to your concerns, provide facilitation or mediation services when appropriate, value diversity, hear all perspectives, assist you in considering your options for resolution, and remain impartial to all parties involved. Services are confidential And no identifying records are kept.

Educating the university community and maintaining effective processes are important components of preventing conflicts from escalating, and can help enable university students and employees to effectively address adversity themselves. Training is available in alternative conflict resolution techniques, theory, and practice. Workshops are customized to fit specific needs. Recommendations may be made to improve processes that may inadvertently create conflicts, or inhibit informal resolution. Our hope is to create an environment that supports the early resolution of conflict.

The Office of Student Mediation and Conflict Resolution is in the Arkansas Union, Room A677A; phone (479) 575-4831.

### Greek Life

The Office of Greek Life facilitates the educational process and provides resources related to programs that promote the growth and development of students affiliated with fraternities and sororities on campus. The overall mission is to enhance the academic, cultural, moral, and social development of students in Greek organizations; provide training in leadership and other personal and social skills; promote student involvement in extracurricular activities and community service projects; and promote Greek Life as a productive and viable lifestyle on campus. Programs such as Recruitment, Greek Weekend, Greek Life Facilitators, and Greek 101 are coordinated by the Office of Greek Life, the Interfraternity Council, and the Panhellenic Council.

The Interfraternity Council (IFC), Panhellenic Council (PHC), and National Pan-Hellenic Council (NPHC) are the governing bodies for 10 national sororities and 16 fraternities. The officers and representatives of IFC, Panhellenic, and NPHC work with the Office of Greek Life to provide positive programs and leadership opportunities to the members of the Greek organizations. The Greek Life Office is in the Arkansas Union A697; phone (479) 575-5001 or FAX (479) 575-3531; Web: <http://uagreeks@uark.edu>.

### Multicultural Center

The Multicultural Center exists to enhance the University of Arkansas' academic experience by preparing students for life in a pluralistic society. The staff seeks to provide a "home away from home" atmosphere for African American, Latino/a, Native American and Asian American students; to provide an environment that promotes cross-cultural interaction; and collaborate with the University community in providing educational, cultural, social programs, and resources to assist in the development and advancement of a diverse community. The Center also offers a large gallery area for programming, displays and exhibits, a small resource library, and informal lounge. The Center is in the Arkansas Union, Suite 404; phone (479) 575-2064; Internet: <http://www.uark.edu/studorg/samc/>.

### Multicultural Student Services

The Office of Multicultural Student Services seeks to develop and use existing programs to provide for the social, cultural, and academic presence of students of color on campus. In addition, we strive to educate and sensitize the campus community concerning diversity and to provide resources to help each individual and university department to acquire the skills and knowledge needed to make the University campus a place that truly respects and appreciates diversity. For more information, contact the office of Multicultural Student Services in the Arkansas Union, Suite 404 or call (479) 575-2064.

### Reasonable Accommodations for Students with Disabilities

The Center for Students with Disabilities (CSD), 104 Arkansas Union, serves as the central campus resource for students with disabilities. Working in partnership with students, faculty, and staff, the goal of the CSD is to ensure a physically and educationally accessible University environment. CSD staff work individually with students and assist academic and non-academic units to determine reasonable accommodations that will enable every student to have access to the full range of programs, services, and activities offered through the University.

For more information contact the CSD at Center for Students with Disabilities, 1 University of Arkansas, 104 ARKU, Fayetteville, AR 72701, phone (479) 575-3104 (voice); (479) 575-3646 (TTY); e-mail: [ada@uark.edu](mailto:ada@uark.edu); Internet <http://www.uark.edu/us/csd/>.



### Office of Community Standards and Student Ethics

The mission of the Office for Community Standards and Student Ethics (OCSSE) is to provide an equitable and effective educational system that promotes responsibility, individual growth, accountability and student learning through community outreach, peer mentoring, and enforcement of the Code of Student Life. The office is designed to provide an equitable process for dealing with alleged Conduct Code infractions by students of University rules, regulations, and/or laws. This system is informal, non-adversarial and is intended to be a part of the total educative process of the University. Students are encouraged to make responsible decisions and to be accountable for their actions. In addition, students who witness violations of the Code or who are victims of inappropriate or illegal behavior perpetrated by other students are encouraged to report to the Office of Community Standards and Student Ethics.

For more information see the Student Handbook, available in Administration Building 325. The Office of Community Standards and Student Ethics is in the Administration Building, Room 325, telephone (479) 575-5170; Internet <http://dos.uark.edu/ethics.html>.

### First Year Experience Programs

The First Year Experience Program at the University of Arkansas is a collaborative effort developed to provide transitional support for incoming students through a variety of classroom and co-curricular activities. The experience is designed to enhance both the academic and social integration of first-year students. Faculty, Student Affairs professionals, and staff work together to offer special assistance and skills designed not only to help incoming students experience a fulfilling, rewarding, and successful first year at the University but also to assist them in reaching their ultimate goal of completing a degree.

The First Year Experience Program, centrally located in the Arkansas Union, consists of six major areas: Orientation, R.O.C.K. Camp, Welcome Weeks, Academic Convocation, and Family Weekend, in addition to the First Year Experience Seminar Course. Each of these programs is geared towards adapting students to college life and improving their first year experience. Faculty members participate in these events, as speakers, mentors, or through other means of engagement. The First Year Experience Advisory Board includes Associate Deans from Academic Affairs as well as Student Affairs Professionals. We believe that by providing transitional support for our students we are effectively promoting their academic growth and upholding the mission of the institution.

The First Year Experience Program office is in the Arkansas Union, Room A687; phone (479) 5002; Internet: <http://www.uark.edu/admin/fye>.

## PRE-COLLEGE PROGRAMS

The Office of Pre-College Programs consists of six programs, which serve populations that demonstrate the potential and desire to attend college. These programs are the Academy for Mathematics and Sciences, Educational Talent Search, College Project, Upward Bound, Veterans Upward Bound, and Youth Opportunities Unlimited, the first five of which are federally funded TRIO programs. The programs focus on providing equal opportunity for potential first-generation college students who aspire to continue their education at the collegiate level. Eligibility requirements include, but are not limited to, having first-generation status and exhibiting academic potential. All participants receive multifaceted services to assist them with developing the skills, information, and resources necessary for college success.

As an ongoing mission, Pre-College Programs actively solicits collaborative partnership with businesses, communities at large, and various departments within Student and Academic Affairs. These efforts enrich the services and learning opportunities available to participants

and provide possibilities for the expansion of programming. For additional information, visit our office at 200 Hotz Hall or contact us online at <http://ubets.uark.edu>, or call (479) 575-3553.

### Academy for Mathematics and Sciences

As a federally funded Upward Bound Math and Science Center, the Academy serves students in grades 9-12 from a four-county area in Northwest Arkansas. This college preparatory program includes a six-week residential component in the summer and an academic component year round. An integrated curriculum focusing on involvement with faculty and participation in group and individual research projects in math, science, and engineering is supplemented with course offerings in English, literature, Latin, and computers. College tuition and credit are available to students bridging from their senior year in high school to college.

### Educational Talent Search and College Project

Educational Talent Search and College Project are early intervention programs serving 1800 6<sup>th</sup>–12<sup>th</sup> grade students in Northwest Arkansas and Northeastern Oklahoma. As a primary mission, the programs promote the skills and motivation necessary for students to successfully complete a baccalaureate degree. Emphasizing personal/career development, technological/academic skills, ACT readiness, and college preparatory workshops, students are prepared to meet their college entry goals. Academic monitoring, counseling, and tutoring services are incorporated to facilitate the progress of each student. Summer enrichment and campus based events provide ongoing opportunities for institutional and faculty involvement. Students participating in College Project are selected from schools in specified districts eligible to receive Indian Education funds.

### Upward Bound

Upward Bound challenges students to develop the essential skills, study habits, discipline, and attitudes necessary for success in high school and college. The mission of Upward Bound is to prepare and motivate high school students to pursue and complete a baccalaureate degree. The project serves 60 students in grades 9-12. Participants commit to the program until graduation from high school and participate in both a six-week summer residential program and an academic year component.

### Veterans Upward Bound

Veterans Upward Bound is designed to identify and serve the unique needs of 120 eligible veterans from Northwest Arkansas who have the academic potential and desire to enter and succeed in a post-secondary program of study. Eligible veterans have completed a minimum of 180 days of active duty in the military or Coast Guard and hold a discharge other than dishonorable. Services include tutoring; guidance counseling; access to technology; assistance in filing financial aid and VA benefit forms; academic/career advisement; test preparation for entrance exams; and intensive academic instruction in English, Spanish, math, and science. Courses are offered days and evenings each semester.

### Youth Opportunities Unlimited (Y.O.U.)

This statewide, comprehensive program is designed to encourage economically disadvantaged 14- and 15-year-old students to remain in school by providing experiences for the development and enhancement of basic educational and vocational skills. A summer residential component combines a university work-based program with a wide range of support services encompassing health care, counseling, and enrichment courses. Participants receive ongoing follow-up services including monthly telephone contacts, supplemental newsletters, and regular mailings.



## UNIVERSITY CAREER DEVELOPMENT CENTER

The Career Development Center provides a comprehensive career development program designed to meet the needs of the University of Arkansas community. The Center assists students and alumni in the development of skills necessary for lifelong career management.

The Center provides individual and group career advising sessions; a one-hour credit "Career Decision-Making" course; career planning and job search workshops; individual assistance with Resume Preparation and Job Interview Skills; resources for experiential education opportunities; Career Interest Assessments; a Career Resource Library; and Placement Services.

Students are encouraged to begin working with the staff of the Career Development Center during their first year at the University of Arkansas. Advisors assist students in selecting a College Major, in obtaining a Cooperative Education or Internship placement, and in preparing for their Job Search or Graduate/Professional School application. A full-range of Career Fairs is offered each semester including all-campus fairs and individual industry-specific fairs.

The Career Development Center staff members welcome opportunities to present career planning or job search information to students in the classroom. The Career Center also encourages faculty and staff to partner with them in hosting employers for On-Campus Recruiting visits. There are valuable opportunities to develop strong professional relationships with the 300-400 corporate recruiters who visit our campus each year.

The University Career Development Center provides services and educational programs to students, alumni, former students, faculty, staff, and their families. A satellite Career Center in the Walton College of Business serves students and alumni in the Walton College.

For further information, contact the University Career Development Center, ARKU 607, (479) 575-2805, or visit our Web site at <<http://career.uark.edu/>>.

## UNIVERSITY HEALTH CENTER

The University Health Center provides medical and mental health care and is an advocate and resource for health promotion and education for students, spouses of students, and employees of the University of Arkansas.

The Health Center offers the following services: outpatient medical care; an allergy clinic; international travel immunizations; a women's health clinic; sports medicine; Counseling and Psychological Services (CAPS); substance abuse prevention; health education classes and programs; clinical laboratory, x-ray, and pharmacy. The medical staff is comprised of six board-certified physicians. The professional staff also includes full-time nurse practitioners, registered nurses, licensed practical nurses; health educators, a psychiatrist, psychologists, counselors, psychiatric social workers, registered lab and x-ray technicians, and licensed pharmacists.

Students pay a per credit hour semester health fee that covers professional office visit charges. Student spouses may pay the health fee on an optional basis. Services other than professional office visits are the responsibility of the patient and/or their health insurance plan.

The University strongly recommends that all students have health insurance. A policy endorsed by the Associated Student Government is available to all students, student spouses, and their dependent children. Students may enroll in this plan at the Student Health Insurance office at the University Health Center.

The University Health Center welcomes inquiries about specific services at (479) 575-4451; TTY (479) 575-4124. More information is available on the Web at <<http://www.uark.edu/depts/healthinfo/>>.

## UNIVERSITY HOUSING

University Housing is committed to providing a quality living and learning environment that both challenges and supports the personal, social, and academic development of our residents and their diverse communities.

Experience and extensive research nationwide has shown that academic success in the first year and beyond is directly linked to residing in an on-campus residence environment. In an effort to increase the academic success of our entering students, the University of Arkansas requires all freshmen under the age of 21, who do not reside with a parent, to live in an on-campus residence hall. Requests for exception to the freshman residency requirement may be made, based on severe financial or medical need. Contact University Housing for more information.

Each residence hall has a Resident Director. This individual is selected for his/her academic credentials and interest in helping others, as well as his/her ability to work well with college students. In addition, every area or floor is staffed by a Resident Assistant and an upperclassman, each with training, experience, and knowledge to answer students' questions and, more importantly, to help students find their own answers. Counselors in Residence (graduate assistants) provide short-term counseling for students living in the residence halls and University apartments, in response to personal, social, academic, and developmental needs. Assistant Directors are full-time, master's degree level, Residence Life professionals. They live on campus and are responsible for three to six residence halls. Access to residence halls is controlled by electronic card readers, which allow **only** residents and their escorted guests to enter.

Residential living offers several options: Male, female, graduate, or co-ed. Rooms are available for visually or hearing impaired students, as well as those who are physically challenged. Special-interest living options, such as honors programs, first year experience, substance-free, architecture, engineering, pre-med/science, business, and nursing, are also available to students. Additional information is available on the University Housing website, at <http://housing.uark.edu/>.

Each of the three separate dining facilities on campus is managed by Campus Dining Services and provides a natural setting for socializing with friends and enjoying a wide variety of high quality, nutritious meals. All students living in a residence hall, except for those living in a graduate-only facility or residing in summer school housing, are required to have a meal plan. There are several meal plans available to meet the needs of both on-campus and off-campus students. Learn more about Campus Dining Services online, at <http://dining.uark.edu/>.

## ARKANSAS UNION

The mission of the Arkansas Union is to provide unique and diverse services, programs, conveniences, and amenities primarily for students, as well as for other members of the University of Arkansas family - faculty, staff, alumni, and guests. As the center of the college community life, the Union compliments the academic experience through an extensive variety of cultural, educational, social, and recreational programs. These programs provide the opportunity to balance course work and free time as cooperative factors in education.

The Arkansas Union serves as the community center of the University for all members of the college family. As the "living room" of campus, the Union is the gathering place of the University. The Union provides services and conveniences that members of the college community need in their daily lives and creates an environment for getting to know and understand others through formal and informal associations. Included in the Union are Meeting, Reception, and Banquet rooms; Lounges; Ballroom; Anne Kittrell Art Gallery; Theater; Video Theater; and a Computer Lab. The Food Court offers Chick Fil A<sup>®</sup>,

Burger King®, salads, soups, Trattoria® pizza/pasta, Upper Crust® submarine sandwiches, Austin Blues Bar-B-Que™, hot rotisserie foods, Mexican specialties, baked items, and a Mongolian Wok. RZ's Coffee-house® with frozen yogurt, and a Stop Gap "grab and go" convenience store are in the Connections Lounge. Complete catering services are provided for meeting and function support. In addition, the Union houses the University Bookstore, U.S. Post Office, Union Jack Hair Cutters, The Travel Depot, Quick Copy Center, Razorback Shop, Computer Store, and a games area.

As the center of the college community life, the Union complements the academic experience through an extensive variety of cultural, educational, social, and recreational programs. These programs provide the opportunity to balance course work and free time as cooperative factors in education. The Arkansas Union is the center of much student activity and is a perfect place for students to get involved on campus. University Programs provides many student events and activities. These activities are planned, organized, and presented almost totally by students. Typical programs are major concerts, symposium speakers, theater productions, video programs, fine arts programs, and art gallery shows. The Union is a student-centered organization that values participatory decision-making. Through volunteerism, its boards, committees, and student employment, the Union offers firsthand experience in citizenship and educates students in leadership, social responsibility, and values.

The Student Life Center in the building addition provides office space for many Registered Student Organizations and Student Support offices. The Office for Student Involvement and Leadership provides resources for student organizations. Over 250 student organizations including Associated Student Government, University Programs, and the student radio station are housed in the Union. Many other offices provide goods and services to support students. The Student I.D. Card Office, Razorback\$ program, and the Information Center are administered by the Arkansas Union. Offices for Student Involvement and Leadership, First Year Experience, Minority Student Services, Greek Affairs, Orientation, Non-Traditional Students, Assistant Vice Chancellor for Student Affairs, Multicultural Center, University Career Development Center, Center for Students with Disabilities, and other programs are in the Union. For more information, visit the Arkansas Union website at <http://www.uark.edu/campus-resources/union/>.

### Office for Student Involvement and Leadership

The Office for Student Involvement and Leadership, in the Arkansas Union, is the central location for student organizations and activities for the University of Arkansas. The main goal of the Office is to provide all students with opportunities for involvement and to enable students to learn and practice leadership and management skills that complement classroom learning. The Office for Student Involvement and Leadership is responsible for the oversight and administration of five major areas:

#### 1. Student Organizations

Student Organizations-All student organizations, must register annually with the Office for Student Involvement and Leadership. This registration information is kept on file to assist students and administrators in learning more about particular organizations. The Office for Student Involvement and Leadership provides student organizations with assistance and services to help them succeed, including the annual Student Involvement Fair, facility reservations and fund-raising assistance, trademark forms, mailboxes, and locker space.

The office also assists student organizations in event planning and presentation. Limited office space in the Arkansas Union is awarded annually to organizations by the Union Governing Board.

#### 2. Leadership Development and Volunteer Programs

The Leadership Development Programs are designed to help students gain and refine leadership and management skills, and to network with other campus leaders. Some of the conferences and retreats require

a minimal registration fee. Programs include: Emerging Leaders, Leadership Conferences and Retreats, and the Leadership Resource Library. Student team members and mentors are utilized to help plan and implement each of these programs. This experience serves as a part of the educational process for the students involved. The Volunteer Action Center encourages community service and service learning. A student e-mail list acts as a clearinghouse for volunteer and community service opportunities within the surrounding area. Large scale volunteer events such as "Make A Difference Day" and "Students' Day of Caring" are also sponsored by this area. Both of these programs perform multiple volunteer projects on a particular day, one in the fall, and the other in the spring.

#### 3. University Programs

University Programs is a volunteer student organization responsible for coordinating and planning over 350 events annually for the campus community. Staff members serve as advisers to University Programs. University Programs provides UA students with cultural and educational experiences, entertainment, and fun. Eight committees, committee chairpersons, and three executive officers select, schedule, and produce events such as concerts, movies, lectures, fine arts performances, gallery exhibits, and much more for the UA community. University Programs provides excellent opportunities to develop leadership skills and to gain practical experiences in a variety of areas. Supported by an activity fee instituted in 1988, University Programs events with the exception of major concerts, are free to students.

#### 4. Associated Student Government (ASG)

See Campus Governance in the Code of Student Life, available in room 325 of the administration building.

#### 5. Friday Night Live (FNL)

Late night weekend programming at the University of Arkansas is a collaborative retention effort designed to assist students in developing new and diverse relationships, participating in interactive social events, and promoting healthy lifestyles. The programs occurring on campus during the weekend are the highest quality, represent a multiplicity of views, bring individuals together into a community setting, and are diverse enough to be enjoyed by all who participate.

## STUDENT ACTIVITIES

An integral part of a University education is what can be gained through the worthwhile use of leisure time. Students are encouraged to balance involvement with their academic pursuits and interests. There are organizations, intramural sports, spectator sports, lectures, concerts, theatrical offerings, and other activities in which the student is encouraged to participate. The Northwest Arkansas region represents one of the best recreational areas in the nation.

### Organizations

Student organizations vary from those in professional fields to those representing extracurricular activities. They include religious organizations, community-oriented outreach programs, political interest groups, student publications, minority groups, departmental and professional organizations, social/fraternal organizations, and various honorary societies. Twenty or more religious organizations conduct programs of spiritual guidance and social activity at the University of Arkansas, and many have student centers near campus.



# Honors College

## Honors College

418 Administration Building  
(479) 575-7678

## Academic Scholarship Office

518 Old Main  
(479) 575-4464

## Office of Post-Graduate Fellowships

418 Administration Building  
(479) 575-7678

## Advanced Placement Summer Institute

418 Administration Building  
(479) 575-4884

## Interim Dean

Bob Smith, Ph.D., Provost  
University of Michigan

## Associate Dean

Suzanne McCray, Ph.D.  
University of Tennessee

## World Wide Web

<http://honorscollege.uark.edu>

**E-Mail:** [honors@uark.edu](mailto:honors@uark.edu)

## MISSION STATEMENT

The mission of the Honors College at the University of Arkansas is to provide exceptional opportunities for outstanding undergraduates, to enhance their educational experiences and academic performances, and to serve the University by underscoring its reputation as a research institution where students come first. This mission incorporates four areas of responsibility: recruitment, administration of honors fellowships, coordination of honors programs and curricula, and coordination of related services.

## ORGANIZATION AND FACILITIES

**The Dean's Office** for the Honors College is housed on the fourth floor of the Administration Building. Large, newly renovated honors lounges, designed as study and relaxation areas for students, may also be found on the fourth floor. The Honors College was created by a \$200 million dollar gift from the Walton Family Charitable Support Foundation with the goal that an honors education would be available in every college, with the Honors College serving as an umbrella organization, providing coordination of honors efforts among the colleges and additional scholarship and service opportunities for participating students.

**The Academic Scholarship Office** is part of the Honors College. Scholarships are awarded to a variety of students, both incoming and current, at the University of Arkansas. Students do not have to be in the Honors College to receive many of these scholarships though participation in honors of qualified students is always encouraged.

Scholarships awarded to incoming freshmen not funded through the Honors College include the Bodenhamer Scholarship, the Chancellor's Scholarship, the University Scholarship, and the Leadership Scholarship. Scholarships for current students include the Brandon Burlsworth Memorial Scholarship, the R. Coin Mason Scholarship, the Blanche Bledsoe and Clarence J. Rosecrants Senior Endowed Scholarship, the Boles-Zaulx Scholarship, the Alfred Allen Scholarship and many more. These scholarships are available to students across the University. For additional information see the chapter on Financial Aid and Scholarships in this catalog.

**The Office of Post-Graduate Fellowships** provides assistance to all students who are applying for international graduate fellowships — the Marshall, Rhodes, Gates Cambridge, Rotary, and Fulbright, and national graduate fellowships such as those provided by the NSF, the Department of Defense, the Department of Energy, and the Mellon and Jacob Javits Foundations. The office also assists students with applications for nationally competitive undergraduate scholarships — Barry Goldwater (for outstanding sophomores and juniors in mathematics, science, and engineering), the Truman (for outstanding juniors interested in pursuing

a career in public service), the Morris Udall (for competitive students who intended to pursue a career connected to environmental concerns), the James Madison (for students who want to become educators in the social sciences) and many more. The office also provides assistance to graduate, law, and medical school applicants.

**The Honors College Governing Board** consists of the Chancellor, the Provost, the Dean of the Honors College, the Vice-Chancellor for Student Affairs, and the Vice Chancellor for University Advancement.

**The Honors College Directors' Council** consists of the Directors of the Honors Programs in each of the colleges and is chaired by the Associate Dean of the Honors College. The Honors Directors include the following:

Duane Wolf, Dale Bumpers College of Agricultural, Food and Life Sciences, Plant Sciences 115  
 Kim Sexton, School of Architecture, Vol Walker 120  
 Sidney Burriss, Fulbright College of Arts and Sciences, Old Main 517  
 John Norwood, Walton College of Business, Walton College of Business 328  
 Jerry Dwyer, College of Education and Health Professions, Peabody Hall 8  
 Bill Warnock, College of Engineering, Bell Engineering 3189

**The Advanced Placement Summer Institute** is a College Board approved summer program coordinated by the Honors College. The institute provides training to Advance Placement teachers in American history, biology, calculus, chemistry, composition, computer science, government, literature, physics, psychology and statistics.

### ADMISSION TO THE HONORS COLLEGE

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Admission to the Honors College requires that a student first be admitted to an honors program in the college of major. Students admitted to a program are automatically included in the Honors College. Students admitted to the Honors College must have a minimum 28 ACT or SAT equivalent and a minimum 3.5 high school graduate point average. These are the basic requirements for each of the honors programs except the Walton College of Business, which requires a 28 ACT or SAT equivalent and a minimum 3.75 high school grade point average. Students can also be admitted at the end of the freshmen year by earning a 3.5 on 30 completed hours or through the end of the sophomore year by earning a 3.5 on 60 completed hours (the total does not include Advance Placement or CLEP credit).

### HONORS COLLEGE SCHOLARSHIPS

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The Walton Family Charitable Support Foundation endowed two major scholarships for incoming freshmen to be administered by the Honors College. The Foundation also endowed funds for current honors students for study abroad and undergraduate research.

**Honors College Fellowships** provide \$50,000 over a four-year period for outstanding incoming freshmen. A separate application is required (applications are available on the Honors College Web page). The deadline for application is February 1. Students will also be required to interview for the fellowships. The award covers tuition, room and board, and provides additional monies for the purchase of a computer and for study abroad.

**Honors College Academy Scholarships** provide \$16,000 over a four-year period for outstanding incoming freshmen from under-represented counties in Arkansas. The application for admission serves as the application for this scholarship.

**Honors College Study Abroad Grants** are available to competitive students in the Honors College who have completed a minimum of 30 hours, 6 of which must be in honors. A separate application is required and is available in the Honors College Office. Deadlines are October 15 and February 15.

**Honors Undergraduate Research Grants** are available to competitive students in the Honors College who have completed a minimum of 30 hours, 6 of which must be in Honors. A separate application is required and is available in the Honors Office. The application includes a five-page summary of the proposed research and a detailed letter of support from the research mentor. Deadlines are October 15 and February 15.

### HONORS COLLEGE INTERNSHIPS

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Fifty Honors College internships are offered each semester. Students register for a one-hour credit course. The course provides information on applying for scholarships, writing resumes and personal statements, and interviewing skills for internships and fellowships. Interns also receive a \$300 stipend for assisting with recruitment.

### HONORS DEGREES

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The Honors College does not confer degrees. Honors degrees are conferred by the college of major.



# Dale Bumpers College of Agricultural, Food and Life Sciences

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## Dean of the College

E-108 Agricultural, Food  
and Life Sciences Building  
479-575-4446

## Advising Office, Scholarships, Student Relations

E-108 Agricultural, Food  
and Life Sciences Building  
479-575-2252

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## Dean

Gregory J. Weidemann, Ph.D.  
University of Wisconsin

## Associate Dean

Donna L. Graham, Ph.D.  
University of Maryland

## Associate Director/Associate Dean

Richard A. Roeder, Ph.D.  
Texas A&M

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## World Wide Web

<http://www.uark.edu/depts/dbcafls>

## E-Mail:

[dbcafls@uark.edu](mailto:dbcafls@uark.edu)

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## OBJECTIVES

The objectives of the Dale Bumpers College of Agricultural, Food and Life Sciences are to improve agriculture and family living in Arkansas, to stimulate students in their own development, to foster an attitude of inquiry and to develop leadership.

To accomplish this, the curricula are designed to include basic courses in physical, biological and social sciences, mathematics, the humanities, and communications, as well as agriculture and human environmental sciences. Such education is important to prepare young men and women for careers for the 21st century.

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## HISTORY AND ORGANIZATION

As the land-grant university of Arkansas, the University of Arkansas has the responsibility for leadership in agricultural and human environmental sciences. This responsibility is shared with the Division of Agriculture, and it includes teaching, research and service functions.

The Bumpers College is an integral component of the University of Arkansas and addresses the teaching responsibility of the land-grant university. Its roots lie in the First Morrill Act of 1862, which created the land-grant system by providing a grant of land to each state for the establishment of a college "where the leading objective shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanical arts in such manner as the legislatures of the state may prescribe to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." Agricultural sciences have been taught at the University of Arkansas almost from the beginning of the institution in 1872. The first degrees in agriculture were conferred by the University in 1904.

The passage of the Hatch Act in 1887 and subsequent legislation made possible the Agricultural Experiment Station, the research component of the Division of Agriculture. Most faculty who teach in the Bumpers College also hold appointments in the Experiment Station and are able to incorporate active research into their teaching.

The dissemination of University research in agriculture and human environmental sciences is carried out by personnel in the Cooperative Extension Service, created by the Smith-Lever Act of 1914. Many Extension specialists also hold adjunct faculty status and bring their expertise to the teaching program.

It is this blending of teaching, research and service functions that create a unique learning environment in the College. As students learn to relate basic areas of science to human needs, they study in laboratory-based classes and are taught in research facilities supported by the Division of Agriculture. Similarly, students are encouraged

to intern with professionals in industry and governmental agencies, including the Cooperative Extension Service.

The School of Human Environmental Sciences was originally established as the department of home economics in 1913. The department was elevated to school status in 1994, and its name was changed to the School of Human Environmental Sciences.

In recognition of the land-grant mission of the University and its commitment to serve the entire state, the Dale Bumpers College of Agricultural, Food and Life Sciences has worked cooperatively with numerous community colleges to organize the Arkansas Consortium for Teaching Agriculture (ACTA). ACTA is designed to facilitate the "seamless" transfer of students from community colleges to the Bumpers College. Coordinated advising, recruiting and curricula development are working goals of the Consortium. Students interested in ACTA should contact the dean's office.

### Services for Students with Children

There are two services administered by the School of Human Environmental Sciences that can benefit young children whose parents are students at the University of Arkansas.

The Infant Development Center (IDC), located at 536 N. Leverett Street, provides care for children age three months to three years. At least one parent must be a UA student, and priority is given to undergraduate parents, single parents, and families in which both parents are UA students.

The Nursery School provides care for children from the entire community who are between the ages of three and five years.

Enrollment in each program is limited, and no provision is made to accommodate "drop-ins." For fee and other information, call the School of Human Environmental Sciences at (479) 575-4306.

### DEGREES OFFERED

All entering students (including freshmen, international and transfer students) admitted to the University of Arkansas, Fayetteville, are eligible to pursue a degree program in the Dale Bumpers College of Agricultural, Food and Life Sciences. Degrees offered are as follows:

The Bachelor of Science in Agricultural, Food and Life Sciences (B.S.A.)

The Bachelor of Science in Human Environmental Sciences (B.S.H.E.S.)

The Bachelor of Interior Design (B.I.D.)

### Non-Degree Training

While most students enrolled in the Dale Bumpers College of Agricultural, Food and Life Sciences work toward a degree, students who desire additional education of a specific nature but who do not wish to fulfill all requirements for a degree may enroll as special or unclassified students.

### COLLEGE SCHOLARSHIPS

In addition to the scholarships awarded by the University, there are a number of scholarships available to students in agricultural and human environmental sciences made possible by generous gifts from many firms and individuals. During the 2001-2002 school year, the College awarded approximately 375 scholarships for over \$670,000. To be considered for a college scholarship, students must first be admitted to the University. Most scholarships require students to be enrolled full-time, which is at least 12 credit hours per semester. A College scholarship application, which serves as an application to all available scholarships offered by the College, must be submitted by March 1 each year (priority deadline for new freshmen is February 15). A listing of various outside scholarships is available for review

in the dean's office, E-108, Agricultural, Food and Life Sciences Building and on the college's web-site. There are also miscellaneous outside scholarships for which applications are available in some departmental offices. For more information on scholarships, contact the dean's office.

### STUDENT ORGANIZATIONS, BUMPERS COLLEGE

The **Agricultural Business Club** is a student organization for those interested in agricultural business and economics.

**Agricultural Communicators of Tomorrow (ACT)** is designed for students with an interest in agricultural communications. It allows students an opportunity to interact with others with similar interests at the college and professional level.

The **Student Branch, American Society of Agricultural Engineers (ASAE)** is an organization for students interested in agricultural engineering.

The **American Society of Interior Designers (ASID)** is a professional society dedicated to serving the entire profession and maintaining the highest possible standards for the practice of interior design. ASID student members participate in a wide range of learning experiences and stimulating programs that complement their academic training. Through the Society's thousands of professional members, student members gain important insight into the professional aspects of interior design.

The **Arkansas Animal Industry Club** is for students who are interested in any phase of animal science. It is affiliated with the National Block and Bridle Club.

**Collegiate 4-H/FFA** is for any student who has been active in 4-H and/or FFA or has a current interest in service to these youth-serving organizations. This club is especially designed for students interested in teaching agricultural education or working in Extension.

All human environmental sciences majors are eligible for student membership in the **National Association of Family and Consumer Sciences** and in the campus section of the **Association of Family and Consumer Sciences**. Monthly meetings highlight various phases of human environmental sciences and provide social contact with other majors. In addition, members become involved in local service projects and may attend statewide workshops and leadership training sessions.

The **Crop Management/Environmental, Soil, and Water Science Club** is a student organization for those interested in crops and soils through both an agricultural and environmental perspective.

The **Horticulture Club** is a student organization for those interested in horticulture including floriculture, ornamentals, turf, small fruits and vegetables.

The **Pre-Vet Club** is for students interested in veterinary medicine and is especially designed for those students in the pre-veterinary medicine curriculum.

The **Food Science Club** is an organization for those students interested in food science.

The **Northwest Arkansas Association for the Education of Young Children** is an organization for students who are interested in the welfare of young children. The organization, through programs, publications, and trips, offers students information about career opportunities in human development.

The **Student Dietetic Association** is an organization for students who are interested in the profession of dietetics. The purposes are to promote growth in professional attitudes and to provide various programs of interest to the members.

The **Fashion Merchandising Club** is an organization open to all students interested in the fashion industry.

The **Poultry Science Club** is open to all students interested in any phase of the poultry industry or related fields.

There are also numerous general organizations on the University campus, and students of the Dale Bumpers College of Agricultural, Food and Life Sciences participate in most of them. These include fraternities, sororities, honor and scholarship organizations, religious and music groups, sports organizations, and others.

**HONOR SOCIETIES**

**Alpha Zeta** is the professional honor fraternity for students of agriculture. To be invited to become a member, a student must rank in the upper two-fifths of the class and be recognized for leadership and character.

**Phi Upsilon Omicron** is the professional honor fraternity for human environmental sciences students. To be eligible for invitation to membership, a student must rank in the upper 35 percent of the class and be recognized for character and leadership.

**Gamma Sigma Delta** is the honor fraternity for graduating seniors, graduate students, faculty, and alumni of the Dale Bumpers College of Agricultural, Food and Life Sciences. Seniors must rank in the upper 25 percent of their class to be eligible for membership, but not more than 15 percent of the class may be elected for membership. The highest-ranking sophomore and the highest-ranking senior are recognized annually by the society.

**Alpha Tau Alpha** is a national honorary professional fraternity for those preparing to become teachers of agricultural education. Its mission is to develop a true professional spirit in the teaching of agriculture, to help train teachers of agriculture who shall be leaders in their communities, and to foster a fraternal spirit among students in teacher training in agricultural education.

**COLLEGE ACADEMIC AND DEGREE REQUIREMENTS**

**General Residency Requirement**

For the Bachelor of Science in Agricultural, Food and Life Sciences degree, a student may choose one of 15 majors that satisfies his or her interests and goals for educational achievement. Some programs have concentrations; most allow students to select a minor.

For the degree of Bachelor of Science in Agricultural, Food and Life Sciences, students must complete a minimum of 30 semester hours within the Bumpers College.

For the degree of Bachelor of Science in Human Environmental Sciences or Bachelor of Interior Design, students must complete a minimum of 30 hours within the School of Human Environmental Sciences at the University of Arkansas.

**Grade-Point Requirement**

A grade-point average of 2.00 ("C" average) on all work attempted at the University of Arkansas is required for graduation.

**Rules Applying to Course Work Used for Degree Credit**

1. No credit will be given for duplicate coursework.
2. A maximum of six hours of internship and six hours of special problem may be counted for degree credit.
3. Elective courses used for degree credit may be chosen from any department in the University and are subject to the approval of the academic adviser.
4. Students are encouraged to join the University band, chorus and judging teams, and to participate in debate, drama, athletics, etc. A total of six semester hours of elective credits in such activities may be counted toward a degree. The maximum elec-

tive credits in any one activity that may be counted toward a degree are as follows:

	HOURS
Band and/or chorus	4
Drama and/or debate	4
Judging teams	4
Physical education activities or athletics	4

5. Any course taken by correspondence, including Web-based courses, must be approved in advance in the dean's office if the credits earned in the course are to be applied toward a degree. This applies regardless of the school from which the course is taken.

**Requirements for a B.S.A. Degree**

	HOURS
1. A total 124 semester hours with a minimum 2.0 cumulative grade-point average.	124 Total
2. A minimum of 39 hours of courses at the 3000-level and above.	39+
3. University Core Requirements: See page 44 Check requirements for each major; some require specific core courses.	35
4. Other University Requirements ENGL 2003, Advanced Composition or ENGL 2013 (See page 43 for details.)	3
5. College Requirements COMM 1313 Communications Intensive Elective See specific majors for requirement. Bumpers College courses outside of major may be included in departmental requirements	15 3 3 0-9
6. Electives May be used to develop a minor	0-32
7. Departmental Requirements See specific majors and concentrations	33-59

**Requirements to Graduate with Honors**

Students who have demonstrated exceptional academic performance in baccalaureate degree programs will be recognized at graduation by the honors designation of *Cum Laude*, *Magna Cum Laude* or *Summa Cum Laude*. To earn these distinctions, a student must meet the following criteria:

1. At least one-half of the degree course work must have been completed at the University of Arkansas, Fayetteville.
2. Only the grade-point average on course work completed at the University of Arkansas, Fayetteville, will be considered.
3. For each of the three distinctive honors, the student must have the minimum grade-point average indicated.  
(a) *Cum Laude*: 3.50–3.74  
(b) *Magna Cum Laude*: 3.75–3.89  
(c) *Summa Cum Laude*: 3.90–4.00
4. Students may graduate with honors without participating in the Honors Program.

**Additional Requirements**

In addition to the University requirements for graduation, including the University Core requirements (page 44), a student must complete a prescribed degree curriculum in accordance with the rules and regulations of the Dale Bumpers College of Agricultural, Food and Life Sciences to be eligible for a baccalaureate degree from the College.

Former students of the College who are readmitted after an ab-

sence of one year may be expected to meet the curriculum requirements in effect at the time of their readmission. Students should consult their academic adviser for degree planning before registering for classes.

Students interested in earning an additional bachelor's degree should refer to the University requirements on page 44.

## HONORS PROGRAM

The Bumpers College Honors Program provides students with opportunities for intellectual enrichment beyond the traditional undergraduate experience. This is accomplished through special honors courses, completion of an undergraduate honors thesis and other significant activities including interactions with students in honors programs in other colleges.

The results of the student's original research or creative project is published in *Discovery*, the college undergraduate research journal. In support of these efforts, participants in the Honors Program are eligible to receive an honors stipend in support of their research projects. The transcript and diploma of each honors graduate will designate the student as an honor graduate of the college. At the college commencement ceremony, each honors graduate will wear special regalia and have the title of their honors thesis and their mentor's names listed in the graduation program. Honors graduates will be recognized as graduating with Honors distinction. Students must maintain a GPA of 3.25 to remain in the program.

## COLLEGE CURRICULA

The B.S.A., B.S.H.E.S. and B.I.D. degrees will be conferred upon students who have met all the general University and College requirements for a degree, and who have completed 124 semester hours in accordance with the college requirements.

Students, with the assistance of a faculty adviser, will plan a program best suited to their own background, training and objectives. The program of study will be decided after consideration of a student's preparation, aptitudes, test scores, and other information. Undeclared students will work with an adviser as they explore program opportunities within the college. Students must inquire about specific requirements in the department or school where the major is located. Students are responsible for meeting all requirements for graduation.

### Selection of a Major

A student who elects to major in some area of agricultural, food and life sciences or human environmental sciences should plan the program with a faculty advisor. While undecided students are welcome, early selection of a major will permit better planning and proper sequencing of courses. The student and faculty adviser work closely to ensure that curriculum requirements are met in a timely fashion. A student uncertain about a major will be advised as an undeclared major through the dean's office.

## AGRICULTURAL MAJORS AND MINORS

Majors, some with concentrations, are as follows:

### Agricultural Business (AGBS)

Concentration A:

Agricultural Business and Marketing (ABMM)

Concentration B:

Pre-Law (PRLW)

Concentration C:

Agricultural Economics (AGEC)

### Agricultural Education, Communications and Technology (AECT)

Concentration A:

Agricultural Education (AGED)

Concentration B:

Extension and Industry Education (EXIE)

Concentration C:

Agricultural Systems Technology Management (ASTM)

Concentration D:

Agricultural Communications (ACOM)

### Animal Science (ANSC)

### Crop Management (CPMG)

### Environmental, Soil, and Water Science (ESWS)

### Food Science (FDSC)

Concentration A: Food Science (FDSC)

Concentration B: Food Technology (FDTN)

### Horticulture (HORT)

Concentration A:

Horticulture Management and Production (HMAP)

Concentration B:

Horticulture Science (HSCI)

Concentration C:

Horticulture Merchandising (HMER)

### Pest Management (PMGT)

### Poultry Science (POSC)

### Turf & Landscape Horticulture (TLHT)

Concentration A:

Turf Management (TMGM)

Concentration B:

Landscape Horticulture (LHRT)

### Seventeen minors are offered:

Agricultural Business (AGBS)

Agricultural Education (AGED)

Agricultural Systems Technology Management (ASTM)

Animal Science (ANSC)

Crop Management (CPMG)

Entomology (ENTO)

Environmental, Soil, and Water Science (ESWS)

Extension and Industry Education (EXIE)

Food Science (FDSC)

Global Agricultural, Food and Life Sciences (AFLS)

Horticultural Production (HORT)

Journalism (JOUR)

Landscape Design and Urban Horticulture (LHRT)

Pest Management (PMGT)

Plant Pathology (PLPA)

Poultry Science (POSC)

Turf Management (TURF)

## SCHOOL OF HUMAN ENVIRONMENTAL SCIENCES MAJORS AND MINORS

### Food, Human Nutrition and Hospitality, (FHNH)

Concentration A:

Dietetics (DIET)

Concentration B:

General Foods and Nutrition (GFNU)

Concentration C:

Hospitality and Restaurant Management (HRMN)

### Apparel Studies (APST)

### General Human Environmental Sciences (HESC)

### Human Development, Family Sciences,



**and Rural Sociology (HDFS)**

Concentration A:

Child Development (CDEV)

Concentration B:

Lifespan (LSPN)

**Interior Design (IDES)****Two minors are offered in human environmental sciences:**

Human development and family studies (HDFS)

Human nutrition (GFNU)

**Minors in Other Colleges**

Students in the College of Agricultural, Food and Life Sciences may pursue an academic minor in the Sam M. Walton College of Business or in the J. William Fulbright College of Arts and Sciences. These minors usually consist of 15 to 20 hours of course work. For requirements regarding minors, check the catalog under the department offering the minor. Students must notify the dean's office of their intention to pursue a minor.

**Minor in Journalism**

This minor allows for a combination of training in journalism with a specialization in agriculture or human environmental sciences. Its purpose is to prepare the student for employment with firms and institutions that produce agricultural or human environmental sciences publications or employ public relations personnel.

**Requirements for a minor in journalism:**

Students interested in a journalism minor may choose from one of three areas:

Print Journalism (18 semester hours)

JOUR 1023, JOUR 1033, JOUR 2013, JOUR 3013,  
JOUR 3123 and JOUR 3633

Broadcast Journalism (18 semester hours)

JOUR 1023, JOUR 1033, JOUR 2032/2031L,  
JOUR 3072/3071L, JOUR 3633 and JOUR 4863/4860L

Print and Broadcast Journalism (18 semester hours)

JOUR 1023, JOUR 1033, JOUR 2013,  
JOUR 2032/2031L, JOUR 3072/3071L and JOUR 3633

A student interested in a journalism minor must notify his or her major adviser for detailed information. The minor is coordinated by the department of agricultural and extension education in consultation with the department of journalism.

**PRE-VETERINARY MEDICINE**

Because Arkansas does not have a college of veterinary medicine, the Arkansas General Assembly has authorized funds for education in veterinary medicine at out-of-state institutions. The State Board of Higher Education is the designated agent for the State of Arkansas, and the Student Loan Authority is authorized to administer the program. Terms and conditions prescribed by the Student Loan Authority are as follows: the grant will cover only out-of-state tuition, and the student will pay his or her own fees and expenses.

Contracts have been negotiated with the Board of Control for Southern Regional Education for education in veterinary medicine at Louisiana State University, Mississippi State and at Tuskegee University. Arrangements have also been made with the University of Missouri and Oklahoma State University. Under the provisions of the legislation, only citizens of Arkansas are eligible. They must enroll in and complete the pre-veterinary medicine curriculum to satisfy the admission requirements of these colleges of veterinary medicine.

The pre-veterinary medicine program at the University of Arkansas is administered in the departments of animal and poultry science

of the Dale Bumpers College of Agricultural, Food and Life Sciences. There are faculty in these departments who help counsel and advise students regarding their pre-veterinary medicine program. There are also faculty veterinarians who provide some insight into the practice of veterinary medicine and are knowledgeable about many of the problems encountered in establishing a practice upon graduation. Some of these veterinarians have been in private practice; others have been involved in full-time agricultural research since graduation from veterinary medicine and graduate school. Because there is a wide cross-section of experience among these faculty, students find their counsel valuable in planning a future in veterinary medicine.

While it is possible to complete requirements for admission to some colleges of veterinary medicine in two years, most students take three years or more to complete the requirements, and most complete a B.S.A. degree before being admitted. Students who carefully plan their work may complete a B.S.A. degree by transferring hours earned in the first two years at an accredited college of veterinary medicine back to the University of Arkansas, provided they complete certain degree requirements at the University prior to entering a school or college of veterinary medicine. These students must complete a minimum of 94 hours of a 124-hour program of prescribed courses. This will require three years and one or two 6-week summer terms for most students. Therefore, students should inform their adviser early in their program that they wish to be in a pre-vet degree program.

The Bumpers College of Agricultural, Food and Life Sciences is ready to assist students in fulfilling their pre-veterinary medicine requirements whether they desire to complete them in a two-year span or over three or four years. The supporting departments at the University, including chemistry, English and biological sciences, all offer quality courses that give a student an excellent background for the pursuit of a degree in veterinary medicine.

To earn the professional degree, a student must complete the pre-veterinary medicine requirements and the four-year prescribed curriculum in one of the colleges of veterinary medicine.

**Required Examinations**

All required examinations are given on campus and administered by testing services (Hotz Hall 730, phone, 479-575-3948). Exams must be taken at least by late fall of the year prior to entering vet school. Application forms for taking the exams can be picked up at testing services. Applications should be turned in at least 30 days prior to examination. Students seeking admission to Louisiana State University may take the MCAT on one of the two national testing dates in the spring or early fall or the Graduate Record Examination (GRE), which is given frequently.

Students who wish to apply for admission to either Tuskegee University or the University of Missouri must take the VCAT, which is given twice each fall.

Students applying for admission to Oklahoma State University must take the general test and the biology test of the G.R.E., which is given frequently on campus.

**Applications**

Students applying to Louisiana State University and/or Oklahoma State and Mississippi State must fill out a Veterinary Medical College Application Service (VMCAS) form, available at their online site ([www.aavmc.org](http://www.aavmc.org)). Students must complete the application and have it postmarked by Oct. 1st of the year prior to beginning studies. Students applying to the University of Missouri may obtain the application form at <http://www.hsc.missouri.edu/vetmed.docs.adm.html>. Applications must be received by Nov. 1 of



the year prior to entry. Applications forms for Tuskegee University may be obtained from the University of Arkansas department of animal science or directly from Tuskegee University. Application forms are due by Dec. 5th of the year prior to entering school. Since requirements for the various veterinary schools periodically change, it is important that students check with their adviser about specific school requirements as they progress through the pre-veterinary requirements.

All students should contact the Coordinator of Veterinary Medicine, Dale Bumpers College of Agricultural, Food, and Life Sciences B109, University of Arkansas, Fayetteville, Arkansas 72701, phone (479) 575-4351 in the spring prior to making fall application for admission to a veterinary school to verify that they can complete the requirements for the school they wish to attend. Pre-professional requirements and specific requirements for admission to colleges of veterinary medicine at Louisiana State University, Oklahoma State University, University of Missouri and Tuskegee University are listed with information on the Web for the department of animal science at <<http://www.uark.edu/depts/dbcafls/>>.

## GRADUATE STUDIES

The Graduate School of the University, in cooperation with the Dale Bumpers College of Agricultural, Food and Life Sciences, offers the master of science degree in each of its nine departments and in one school. Six doctoral degrees are offered. More detailed information regarding individual programs may be obtained by contacting the administrative office of each department, or by consulting the *Graduate School Catalog*.

## Departments, Degree Programs and Courses

### AGRICULTURAL AND EXTENSION EDUCATION (AGED)

Don R. Herring  
Head of the Department  
205 Agriculture Building  
575-2035

- Emeritus University Professor Hardy
- Professors Graham, Herring, Johnson, Wardlow
- Adjunct Professors Lyles, Baker
- Professors Emeriti Braker, Ferguson, Love, Rolloff
- Associate Professors Arthur, Scott
- Associate Professor Emeritus Scanlon
- Assistant Professor Miller
- Research Assistant Professor Lester
- Adjunct Assistant Professors Burch, Plafcan

The department of agricultural and extension education offers a degree program in agricultural education, communication and technology. Students with this major are in constant demand due to the rapidly changing educational needs of the agricultural and natural resources industries. Graduates with this degree have a broad knowledge of agricultural disciplines. They are prepared as agricultural technology transfer specialists to enter a variety of careers in formal and non-formal teaching roles in either the public or private sector as agricultural educators, Extension agents, industry-based trainers, information specialists or technology-management specialists. Students in agricultural education, communication and technology may

choose one of four areas of concentration listed below, or, with adviser's approval, select courses from more than one concentration area.

### Concentration A - Agricultural Education (AGED)

This area of concentration is designed for students who wish to be certified to teach agricultural science in public schools. Students may choose one of two options for teacher certification: either a four-year certification program or a five-year certification program that culminates in a master's degree (M.A.T.). The department of agricultural and extension education has information about both programs. Admission and graduation requirements for the M.A.T. program are listed on in the College of Education and Health Professions section of this catalog.

### Concentration B- Extension and Industry Education (EXIE)

This concentration is designed for students who desire employment as professional educators/change agents with either the Cooperative Extension Service or in agricultural business and industry. Graduates from this program are in demand because it combines strong leadership, team management, communication and human relations skills with a broad base of competencies in scientific agriculture.

### Concentration C - Agricultural Systems Technology Mgmt. (ASTM)

Students planning a professional career related to technical operations and management in agricultural industry should enroll in this concentration. Graduates assume positions of leadership and responsibility in such areas as agricultural services and sales, agricultural management, agricultural production systems, product service, product testing and service management. The program focuses on preparing students as problem solvers in the application, management and/or marketing of agricultural technology.

### Concentration D - Agricultural Communications (ACOM)

This concentration is designed to produce graduates with both technical knowledge about the food and fiber industry and the communication skills needed to convey in an effective manner the story of agriculture to consumers, policy makers and the public at large. Interpersonal and group communication, public relations, graphic art, video and television production, electronic communication, distance learning, video conferencing and writing for the media are emphasized in this program.

**Requirements for a major in agricultural education, communication and technology** (See page 44 for University Core and page 75 for B.S.A. requirements.)

	HOURS
35 hours of <b>University Core requirements</b> to include:	
<b>English</b>	<b>6 - 9</b>
ENGL 1013 – Composition I	
ENGL 1023 – Composition II	
University Advanced Composition Requirement:	
ENGL 2003 - exemption possible	
<b>MATH</b>	<b>3</b>
MATH 1203 – College Algebra	
<b>Science</b>	<b>8</b>
BIOL 1543/1541L – Principles of Biology/Lab	
CHEM 1074/1071L – Fundamentals of Chemistry/Lab	
(Two semesters of chemistry, CHEM 1103/1101L and CHEM 1123/1121L,	

may be substituted for CHEM 1074/1071L.)

**Fine Arts, Humanities**

6

See University core requirements, page 44

WLIT 1113 or WLIT 1123 (Required for AGED)

**HISTORY**

3

See University core requirements, page 44

**Social Sciences**

9

AGEC 1103 – Principles of Agricultural Microeconomics or

AGEC 2103 – Principles of Agricultural Macroeconomics

PSYC 2003 – General Psychology

See University core requirements for other electives, page 44

**College Requirements**

6

COMM 1313 – Fundamentals of Communication,

AGED 3142/3141L – Agricultural Communications/Lab

**Departmental Requirements - 83 hours**

(includes concentration and elective hours):

CHEM 2613/2611L – Organic Physiological Chemistry/Lab

MBIO 2013/2011L – General Microbiology/Lab or

PHYS 1044 – Physics for Architects (or higher level)

Bioscience elective – (3 - 4 hrs.)

AGED 1001– Orientation to Agricultural & Extension Education

AFLS 1011 – Freshman Orientation

AGED 3133/3130L – Methods in Agricultural Education/Lab or

EXED 4173 – Principles of Extension Teaching

(see concentration for course selection)

AGED 4012 – Program Development or

AGED 3153 – Leadership Development in Agriculture or

EXED 3023 – Introduction to the Cooperative Extension

Service (see concentration for course selection)

AGED 4003 – Issues in Agriculture

AGME 1613/1611L – Fundamentals of Ag Systems Tech/Lab

AGME 2903 – Application of Microcomputers

AGME 4011 – Senior Seminar

ANSC 1032 – Introductory Animal Science

ANSC 1051 – Introduction to the Livestock Industry

CSES 2203/2201L – Soil Science/Lab

CSES/HORT 1203 – Intro to Plant Sciences

CSES 2013 – Pest Management

EXED 475V (3 hrs.) – Internship in Extension

Electives – 10-17 hours selected in conjunction with adviser

**Concentration A (AGED) for teacher certification**

Agricultural electives 13 hours – selected in conjunction with adviser plus the following courses:

AGED 1122 – Agri Youth Organizations

AGED 3133 – Methods in Ag Ed

AGED 4012 – Program Development

AGED 4843 – Methods in Ag Labs

AGME 2123 – Metals and Welding

AGME 3102/3101L – Small Power Units/Turf Equipment/Lab or

AGME 3173/3170L – Electricity in Agriculture or

AGME 4203 – Mechanized Systems Mgmt.

AGME – two hours JR/SR elective

CIED 1002/1011 – Introduction to Education or

AGED 1031 – Introduction to Early Field Experience

CIED 3023 – Survey of Exceptionalities

CIED 3033 – Classroom Learning Theory

ETEC 2001/2002L – Educational Technology/Lab or

AGME 2903 – Applications of Microcomputers

HLSC 3633 – First Responder/First Aid

HORT – 3 elective hours

**Concentrations B: Extension and Industry Education (EXIE) (14–21 hrs).**

BIOL, BOTY, MBIO, ZOO or MATH (above MATH 1203)

Elective – 3 hours

EXED 4173 – Prin of Extension Teaching

(from departmental core)

AGED 3153 – Leadership Development in Agriculture

EXED 3023 – Intro to Coop Extension Service

(from departmental core)

EXED 4183 – Management of Volunteer Programs

5–6 hours from the following:

COMM 3303 – Small Group Communication

RSOC 4623 – Intro Community Dev or

RSOC 2603 – Rural Sociology

AGED 1122 – Agri Youth Organizations

VAED 3113 – Skills/Strategies in HRD

VAED 4113–Theory and Principles of Adult Education

MGMT 3563 – Mgmt Concepts and Organizational Behavior

MGMT 3643 – Team Management

**Concentration C: Agricultural Systems Technology Management (ASTM) (14 to 21 hours).**

Select from:

AGME 2123 – Metals and Welding

AGME 3153 – Surveying in Agriculture and Forestry

AGME 3102/3101L – Small Power Units/Turf Equipment/Lab

AGME 3173 – Electricity in Ag

AGME 4203 – Mechanized Systems Management

AGME 4963 – Soil and Water Conservation Technology

AGME 4973 – Irrigation

PHYS 220V – Intro Electronics I

PHYS 320V – Intro Electronics II

GEOG 4523 – Computer Mapping

GEOG 4543 – Geographic Info Sys

GEOG 4593 – Introduction to Global Positioning Systems

**Concentration D: Agricultural Communications (ACOM) (14–21 hours)**

COMM 2303 – Public Speaking

JOUR 1033 – Fundamentals of Journalism

JOUR 1023 – Media and Society

Select 5 hours from the following:

AGED 4143 –Electronic Communications in Agriculture

AGED 401V (3 hours) – Special Topics: Publication Production

AGED 401V (3 hours) – Special Topics: Contemporary Practices

COMM 3703 – Organizational Communication

COMM 3303 – Small Group Communication

JOUR 2013 – News Reporting I

JOUR 3023 – News Reporting II

JOUR 2032/2031L – Broadcast News Reporting I

JOUR 3072/3071L – Broadcast News Reporting II

JOUR 2332/2331L – Photojournalism I

JOUR 3743 – Public Relations Principles

**Requirements for a minor in Agricultural Education (AGED):**

22 hours to include the following:

CIED 1002, CIED 1011 or AGED 1031, ETEC 2002L/2001, or

AGME 2903, CIED 3023, CIED 3033, AGED 1122,

AGED 3133, AGED 4843, and AGED 4012.

A student completing the requirements for this minor meets the education hours required for entry into the master of arts in teaching (M.A.T.). Students interested in being certified to teach must contact

the department of agricultural and extension education for additional requirements to enter the M.A.T. program.

**Requirements for a minor in agricultural systems technology management (ASTM):**

18 hours to include AGME 1613 and AGME 2903 and

12 hours selected from the following:

AGME 1611L, AGME 2123, AGME 3153, AGME 3102/3101L, AGME 3173, AGME 4203, AGME 4963, AGME 4973

Students planning to minor in ASTM should contact the department of agricultural and extension education.

**Requirements for a minor in extension and industry education (EXIE):**

18 hours to include AGED 1122, AGED 1001, EXED 3023, AGED 3133 or EXED 4173, EXED 475V, and MGMT 3563 or RSOC 4623.

Select 3 additional hours from COMM 2303, COMM 3303 and JOUR 1033.

Students planning to minor in EXIE should contact the department of agricultural and extension education.

**Requirements for a minor in journalism (JOUR):**

18 hours. See page 77 for specific requirements.

**Requirements for a minor in global agricultural, food and life sciences (AFLS):**

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGES 251, 287 AND 252 FOR AGRICULTURAL AND EXTENSION EDUCATION COURSES (AGED, EXED OR AGME)

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**AGRICULTURAL ECONOMICS AND AGRIBUSINESS (AGEC)**

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M. J. Cochran  
Head of the Department  
221 Agriculture Building  
575-2256

- University Professor La Ferney
- Professors Cochran, Dixon, Redfern, Wailes
- Adjunct Professors Millager, Miller
- Professors Emeriti Berry, Headley, Jackson, Meenen, Morrison, Price
- Associate Professors Ahrendsen, Goodwin, Parsch, Popp (M.)
- Assistant Professors Fuller, McKenzie, Popp (J.), Rainey, Thomsen, Watkins
- Adjunct Assistant Professor Bryant
- Adjunct Instructor Hipp

The agricultural business degree program provides education suited to career opportunities in farm management, agricultural business management and agricultural marketing in both the domestic and international areas.

Managers of farms and agricultural businesses are continually required to make organizational and operational decisions. The basic skills and knowledge needed for making sound decisions are provided by the agricultural business curriculum. Students may elect to specialize in areas compatible with their personal objectives, depending upon the extent of accounting and business orientation desired.

Students educated in agricultural business are in demand for positions in agricultural industries, farm operation, marketing agencies, agricultural service organizations, state and federal agencies, and numerous other positions. For those who go on to graduate school, teaching and research positions are available with land grant colleges as well as with other institutions. Three concentrations are available to meet career objectives:

- A. Agricultural Business Management and Marketing (ABMM)
- B. Pre-Law, for students preparing to attend law school (PRLW)
- C. Agricultural Economics, which emphasizes quantitative and analytical skills to prepare students for graduate school (AGEC)

**Requirements for a B.S.A. degree with a major in agricultural business.**

(See page 44 for University Core and page 75 for B.S.A. requirements).

35 hours of **University Core requirements** to include the following:

- PSYC 2003 or SOCI 2013 or RSOC 2603
- AGEC 1103
- AGEC 2103

**University Advanced Composition Requirement:**

ENGL 2003 – exemption possible

**College Requirements:**

- COMM 1313 and
- 3 hours communication elective selected from AGED 3142/3141L, COMM 2303, COMM 2373, COMM 3303, COMM 3383 or ENGL 3053
- General Electives – 20 hours
- College Broadening Electives – 9 hours

**Departmental Requirements (51-52 hours)**

**Concentrations A and B:**

**Agribusiness management and marketing, and pre-law:**

- AGEC 2303 – Intro to Agribusiness
- AGEC 3403 – Farm Business Mgmt.
- AGEC 4613 – Domestic & International Agricultural Policy
- ECON 3033 – Microeconomics
- ECON 3133 – Macroeconomics
- ACCT 2013 – Intro Acct Info I
- ACCT 2023 – Intro Acct Info II
- MATH 2053 – Finite Math
- MATH 2043 – Survey of Calculus
- ISYS 2013 – Business Statistics or
- STAT 4003/4001L – Statistical Methods

**For Concentration A, Agricultural Management and Marketing:**

Select one of the three groups below:

*1. Agribusiness Management*

- AGEC 3303 – Food and Agriculture Marketing
- AGEC 3503 – Agricultural Law I
- AGEC 4143 – Agricultural Finance
- AGEC 4313 – Agri Business Mgmt.
- 9 hours of upper-level AGEC or College of Business courses

*2. Farm Business Management*

- AGEC 3373 – Futures and Options Markets
- AGEC 3503 – Agricultural Law I
- AGEC 4143 – Agricultural Finance
- AGEC 4403 – Advanced Farm Business Management
- 9 hours of upper-level AGEC or College of Business or

technical agriculture courses

### 3. *Agricultural Marketing*

AGEC 3303 - Food and Agricultural Marketing  
 AGECE 3373 - Futures and Options Markets  
 AGECE 4303 - Advanced Agri Marketing Management  
 AGECE 4113 - Agri Prices and Forecasting  
 AGECE 4373 - Advanced Price Risk Management  
 6 hours of upper-level AGECE or College of Business courses

#### **For Concentration B, Pre-Law:**

AGECE 3373 – Futures and Options Markets  
 AGECE 3413 – Principles of Environmental Economics  
 AGECE 3503 – Agricultural Law  
 AGECE 4143 – Agricultural Finance  
 AGECE 4313 – Agri Business Mgmt.  
 ACCT 3613 – Managerial Uses of Accounting Info  
 3 upper-level hours from AGECE, ACCT, FINN, MGMT or  
 ISYS approved by adviser

**3/3 Program.** Exceptional students in the Pre-Law concentration may enroll in the Law School in their fourth year provided that the following requirements have been met:

1. complete all university, college and department core requirements for the pre-law concentration.
2. completed 12 hours in the specialization list for pre-law.
3. a cumulative grade-point average in all college or university course work of at least 3.50 without grade renewal.
4. a LSAT score of at least 159. A student may substitute law school course work for the remaining total hours required for the bachelor's degree in agricultural business.

It is a requirement of the Law School's accrediting standards that no student be admitted to Law School until they have completed at least three-fourths of the work necessary for the baccalaureate degree. The requirements embodied in the 3/3 program satisfy this requirement.

#### **Departmental Requirements (51 hours) for Concentration C, Agricultural Economics:**

AGECE 2303 – Intro to Agribusiness  
 ECON 3033 – Microeconomic Theory  
 ECON 3133 – Macroeconomic Theory  
 ACCT 2013 – Intro to Accounting Info I  
 ACCT 2023 – Intro to Accounting Info II  
 MATH 1213 – Plane Trigonometry or  
 MATH 1285 – Precalculus (in lieu of MATH 1203 and MATH 1213)  
 MATH 2053 – Finite Math  
 MATH 2554 – Calculus I  
 MATH 2564 – Calculus II  
 STAT 4003/4001L – Statistical Methods  
 ECON 4743 – Intro to Econometrics  
 MATH 3083 – Linear Algebra  
 9 hours upper-level AGECE courses  
 6 hours upper-level AGECE or College of Business courses

#### **Requirements for a minor in agricultural business (AGBS):**

18 semester hours to include AGECE 1103 and AGECE 2303;  
 6 hours from AGECE 3303, AGECE 3373, AGECE 3403,  
 AGECE 3413, or AGECE 4313; and  
 6 hours to be selected from the following:

ACCT 2013	ACCT 2023	AGECE 2103
AGECE 3303	AGECE 3373	AGECE 3403
AGECE 3413	AGECE 3503	AGECE 4113
AGECE 4143	AGECE 4303	AGECE 4313

AGECE 4373	AGECE 4403	AGECE 4413
AGECE 4613	AGME 2903	BLAW 2013
ECON 3033	ECON 3133	ECON 3533
ECON 4633	FINN 3043	FINN 3623
ISYS 2013	ISYS 2232	ISYS 3333
ISYS 3603	MGMT 3563	MGMT 3933
MGMT 4403	MGMT 4433	MKTT 3433
MKTT 3533	MKTT 4033	MKTT 4553
MKTT 4933	MKTT 4943 or	STAT 4003/4001L.

Additional upper-division courses in the Sam M. Walton College of Business may be substituted with approval, provided prerequisites for those courses have been satisfied outside the minor. Students interested in postgraduate study in agricultural economics may obtain adjustments to these requirements to accommodate graduate admission requirements.

#### **Minor in Global Agricultural, Food and Life Sciences**

The Bumpers College offers a minor in global agricultural, food and life sciences to provide students throughout the college opportunities to complement their major field of study with an international component. It is designed to provide learning skills and international experiences leading to greater understanding of global issues in agriculture, human and environmental sciences and the ability to participate effectively.

#### **Requirements for a minor in global agricultural, food and life sciences (AFLS):**

18 semester hours to include AGECE 2003;  
 3 to 6 hours study abroad;  
 AGECE 4163 or AGECE 4613 or AGECE 402V (international topic approved by student's adviser and IAP director);  
 6 hours to be selected from the following:

ANTH 1023	ANTH 3123	ANTH 4253
FIIR 2813	GEOG 2023	GEOG 4783
GEOG 4033	GEOG 4013	GEOG 4243
GEOG 4793	HIST 3043	HIST 3203
HIST 4103	PLSC 2813	PLSC 3803
PLSC 3813		

And 3 hours of elective from the following (for students only taking 3 hours study abroad):

AGECE 4163	AGECE 4613	AGECE 402V
COMM 4343	ECON 4633	ECON 4643
ECON 4653	FINN 3703	PLSC 3853

or other courses with an international focus.

SEE PAGE 250 FOR AGRICULTURAL ECONOMICS AND AGRIBUSINESS (AGECE) COURSES

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#### **AGRICULTURAL, FOOD AND LIFE SCIENCES (AFLS)**

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Director of Honors Program  
 E108 Dale Bumpers College of Agricultural, Food,  
 and Life Sciences Building  
 575-4446

The Bumpers College Honors Program provides students with opportunities for intellectual enrichment beyond the traditional undergraduate experience. This is accomplished through special honors courses, completion of an undergraduate honors thesis and other significant activities including interactions with students in honors programs in other colleges. Students must maintain a GPA of 3.25 to remain in the program.

Honors courses in the college may be chosen from the following:



AFLS 1011 – Freshman Orientation  
 AFLS 102VH – Honors Special Topics for Freshmen  
 AFLS 400H – Honors Thesis  
 AFLS 401VH – Honors Special Topics

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## ANIMAL SCIENCE (ANSC)

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Keith Lusby

Head of the Department

B114 Dale Bumpers College of Agricultural, Food,  
 and Life Sciences Building  
 575-4351

- University Professors Emeriti Brown (C.J.), Stallcup
- Professors Brown (A.H.), Kellogg, Lusby, Maxwell, McNew, Roeder, Yazwinski
- Professors Emeriti Daniels, Lewis, Loe, Noland, Perkins, Rakes, Piper, Westing
- Adjunct Professors Brown (M.A.), Davis, Chewning, Jennings, McPeake, Nugent, Pennington, Swiderski, Troxel
- Associate Professors Apple, Coblenz, Coffey, Gunter, Johnson, Kegley, Kreider, Rorie, Rosenkrans
- Assistant Professors, Pohlman
- Assistant Professors Emeriti Heck, Peterson
- Instructors Jack, Kutz

The animal science major is designed to provide the scientific and technical education to prepare students for positions of leadership and responsibility. Students gain valuable experience pertaining to the production of beef and dairy cattle, swine, horses and sheep. In addition, extensive study is offered in the specialized areas of animal health, breeding and genetics, meat science, nutrition, and physiology.

Students majoring in animal science are prepared for a variety of careers. Pre-veterinary, pre-medical and pre-professional course requirements may be fulfilled while meeting degree requirements. Specific career opportunities include positions and services related to the production, merchandising, processing and distribution of meat, milk and related products. Additional opportunities include field persons, farm and herd managers and other agribusiness-related positions. With additional academic training, animal science majors may become extension livestock specialists, nutritionists, geneticists and physiologists.

### Requirements for a B.S.A. degree with a major in animal science:

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core requirements** to include the following:

BIOL 1543/1541L  
 CHEM 1074/1071L

### University Advanced Composition Requirement:

ENGL 2003 – exemption possible

### College Requirements:

COMM 1313 and  
 3 hours communication elective (See adviser for approved course.)  
 Electives: 20 hours

### Departmental Requirements:

58 hours to include the following:  
 CHEM 2613/2611L  
 MBIO 2013/2011L and the following animal science courses:  
 ANSC 1001L – Intro Animal Sci. Lab

ANSC 1032 – Intro Animal Sciences  
 ANSC 1041 – Intro Companion Animal Industry  
 ANSC 1051 – Intro Livestock Industry  
 ANSC 2252L – Intro to Livestock and Meat Evaluation  
 ANSC 2781 – Career Preparation and Development  
 ANSC 3133 – Animal Breeding/Genetics  
 ANSC 3143 – Principles of Animal Nutrition  
 ANSC 3433 – Reproductive Physiology

Select 7 hours from the following:

ANSC 4252 – Cow-Calf Management  
 ANSC 4263 – Swine Production  
 ANSC 4272 – Sheep Production  
 ANSC 4283 – Horse Production  
 ANSC 4452 – Milk Production  
 ANSC 4652 – Stocker-Feedlot Cattle Management

Select 13 hours from the following:

ANSC 3032 – Animal Physiology I  
 ANSC 3042 – Animal Physiology II  
 ANSC 3123 – Principles of Genetics  
 ANSC 3151L – Applied Animal Nutrition Lab  
 ANSC 3152 – Applied Animal Nutrition  
 ANSC 3613 – Meat Science  
 ANSC 3003 – Applied Animal Parasitology  
 ANSC 3013 – Parasitisms of Domestic Non-Herbivores  
 ANSC 3333 – Diseases of Livestock

Select 15 hours from the following discipline-related electives:

ANSC 2003, ANSC 2213, ANSC 2303, ANSC 2482,  
 ANSC 3282, ANSC 3291, ANSC 3491, ANSC 3691,  
 ANSC 3722, ANSC 400V, ANSC 401V, ANSC 410V,  
 ANSC 4291  
 ACCT 2013, ACCT 2023  
 AGECE 1103, AGECE 2103, AGECE 2303  
 AGME 2903  
 CSES/HORT 1203  
 BIOL 2533/2531L  
 CHEM 1103/1101L, CHEM 1123/1121L,  
 CHEM 2262, CHEM 2272  
 AFLS 2013  
 FDSC 2503  
 MBIO 2013/2011L  
 PHYS 2013/2011L, PHYS 2033/2031L  
 POSC 2353, POSC 2363, POSC 2554  
 ZOOL 1613/1611L and

any upper-division course in AGECE, AGED, CSES, AGST,  
 BIOL, CHEM, FDSC, HORT, MBIO, POSC, ZOOL.

Students should consult an animal science adviser for specific course selections in the elective areas. With appropriate advising, students have an opportunity to complete at least one minor within the 124-hour degree program.

### Requirements for a minor in animal science (ANSC):

20 hours to include ANSC 1001L, ANSC 1032, ANSC 1041 or  
 ANSC 1051, ANSC 2252L, ANSC 3133, ANSC 3143,  
 ANSC 3433, and

5 hours from the following production and management courses:  
 ANSC 4252, ANSC 4263, ANSC 4272, ANSC 4283,  
 ANSC 4452, and ANSC 4652.

Students wishing to minor in animal science must consult with an animal science adviser.

**Requirements for a minor in global agricultural, food and life sciences (AFLS):**

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGE 252 FOR ANIMAL SCIENCE (ANSC) COURSES.

**BIOLOGICAL ENGINEERING (BENG)**

Lalit Verma  
Head of the Department  
203 Engineering Hall  
575-2351

- Professors Griffis, Loewer, Verma
- Professors Emeriti Bryan, Nelson
- Adjunct Professors Clausen
- Associate Professors Carrier, Costello, Li, Vories
- Adjunct Associate Professors Beitle, Deaton
- Assistant Professors Bajwa, Chaubey, Kim, Matlock, Osborn
- Adjunct Assistant Professors Haggard, Howell, Wimberly, Yang
- Research Professor Gardisser
- Research Associate Professors Huitink, Tacker, VanDevender
- Research Assistant Professor Murphy

The curriculum leading to the professional degree in biological engineering is under the joint supervision of the deans of the Dale Bumpers College of Agricultural, Food and Life Sciences and the College of Engineering. The engineering degree, Bachelor of Science in Biological Engineering (B.S.B.E.), is conferred by the College of Engineering and is described on page 197. Students who wish to receive this degree enroll in the College of Engineering.

SEE PAGE 259 FOR BIOLOGICAL ENGINEERING (BENG) COURSES.

**CROP, SOIL, AND ENVIRONMENTAL SCIENCE (CSES)**

J. L. Barrentine  
Head of the Department  
115 Plant Sciences Building  
575-2354

- Distinguished Professor Oosterhuis
- Distinguished Professors Emeriti Caviness, Frans, Waddle
- University Professors Oliver, Talbert, Wolf
- University Professor Emeritus Lavy
- Professors Bacon, Barrentine, Bourland, Daniel, Gbur, Miller, Moldenhauer, Norman, Phillips, Rutledge, Stewart, West
- Professors Emeriti Gilmour, Hinkle, Thompson
- Visiting Professor Gealy
- Adjunct Professors Dilday, Johnston, Rutger
- Associate Professors Counce, Longer, Mauromoustakos, McConnell, Muir, Purcell
- Visiting Associate Professor Moore
- Research Associate Professor Davis
- Assistant Professors Brye, Burgos, Chen, de los Reyes, Savin, Sheng, Slaton, Srivastava
- Adjunct Assistant Professor Aiken
- Research Assistant Professors Anders, Gibbons, Mattice, Mozaffari, Tingle, Widick, Wilson

Courses in the department of crop, soil, and environmental sciences provide fundamental and applied studies in two majors: crop management (CPMG) and environmental, soil, and water science (ESWS). Areas studied within the crop management major include plant breeding and genetics, crop and forage production, pest management (weeds, insects, and plant diseases), and soil fertility. The Environmental, Soil, and Water Science major includes courses in areas such as environmental science, water quality, soil science, soil and water conservation, and the sustainable productivity of natural resources. Supporting education in the basic sciences complements courses in the Crop Management and Environmental, Soil and Water Science majors.

Opportunities for employment and post-graduate study are numerous for graduates of the Department of Crop, Soil and Environmental Sciences. Crop Management graduates become involved in crop production or find employment in public agencies providing support services for agriculture (e.g., Extension Service, State Plant Board, Natural Resources Conservation Service), as consultants serving production agriculture, in the agrichemical and seed industries, and in agricultural research programs. Environmental, Soil, and Water Science graduates find jobs with environmental consulting companies, environmental education organizations, state agencies (e.g., Extension Service, Department of Environmental Quality, Health Department), federal agencies (e.g., Environmental Protection Agency, Natural Resources Conservation Service), municipalities and local environmental services (e.g., waste management and recycling, water and wastewater treatment facilities, parks and tourism departments), and a wide variety of private businesses. Many graduates from both majors also choose to continue their education in graduate programs in a wide variety of disciplines both related and complementary to the B.S. degrees.

**Requirements for a B.S.A. degree with a major in crop management.**

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core requirements** to include  
CHEM 1103/1101L and  
CHEM 1123/1121L  
AGEC 1103  
AGEC 2103 (For students wishing to minor in Ag Business)

**University Advanced Composition Requirement:**  
ENGL 2003. If exempt, ENGL 3053 is required.

**College Requirements:**

COMM 1313 and Communication Elective CSES 3023  
Electives: 17 hours

**Departmental Requirements: 63 hours****General Agronomy:**

CSES/ENSC 1012 – Orientation to Crop, Soil and Environmental Sciences  
AGME 2903 or CSCE 1003 – Applications of Microcomputers or Survey of Computer Concepts or  
AGST 4023 or STAT 2303 – Principles of Experimentation or Principles of Statistics  
(students wishing to minor in AG Business should not choose CSES 1003)  
BIOL 1543/1541L – Principles of Biology/Lab  
BOTY 1613/1611L – Plant Biology/Lab  
BOTY 4304 – Plant Physiology or  
ANSC/POSC 3123 or

BIOL 3323 – Principles of Genetics or General Genetics  
 CHEM 2613/2611L – Organic Physiological Chemistry/Lab  
 ENTO 3013 – Intro to Entomology  
 PLPA 3004 – Principles of Plant Pathology  
 CSES 2103/2101L – Crop Science/Lab  
 CSES 2203/2201L – Soil Science/Lab  
 CSES 4013 – Advanced Crop Science  
 CSES 4133/4130L – Weed ID, Morphology and Ecology/Lab  
 CSES 4143/4140L – Principles of Weed Control/Lab  
 CSES 4224 – Soil Fertility  
 CSES 462V – Internship or  
 CSES 400V – Special Problems (1-3 hrs)

Select a total of 8 hours from groups A and B  
 (at least 2 courses from Group A)

*Group A:*

CSES 3113 – Forage Management  
 CSES 3312 – Cotton Production  
 CSES 3322 – Soybean Production  
 CSES 3332 – Rice Production  
 CSES 3342 – Cereal Grain Production  
 CSES 400V – (SP: CCA Review/Certification (1 hr)  
 HORT 2303 – Intro to Turfgrass Mgmt.

*Group B:*

CSES 3214 – Intermediate Soil Science  
 CSES 4103 – Plant Breeding  
 CSES 4234 – Plant Anatomy  
 CSES 4253 – Soil Classification and Genesis  
 CSES 355V – Soil Profile Description (1–2 hrs)  
 CSES 400V – Special Problems (1–6 hrs)  
 PLPA 4333 – Introduction to Biotechnology

Select an additional 9 hours from one of the following two groups of courses. Taking 9 hours from the first group will complete the requirements for a Minor in Agricultural Business. Taking 9 hours from the second group will complete the requirements for a Minor in Pest Management. Students should retain a second adviser in the minor field of study from the appropriate department.

**Minor in Agricultural Business:**

AGEC 2303 – Introduction to Agribusiness  
 AGECE 3403 – Farm Business Management  
 AGECE 3303 – Food and Agricultural Marketing or  
 AGECE 3373 – Futures and Options Markets or  
 AGECE 3413 – Principles of Environmental Economics or  
 AGECE 4313 – Agricultural Business Management

**Minor in Pest Management:**

CSES 4143 – Principles of Weed Control  
 PLPA 4103 – Plant Disease Control  
 ENTO 4123 – Insect Pest Management I or  
 ENTO 4133 – Advanced Applied Entomology

**Requirements for a B.S.A. degree with a major in environmental, soil, and water science:**

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core requirements** to include:  
 CHEM 1103/1101L and  
 CHEM 1123/1121L

**University Advanced Composition Requirement:**

ENGL 2003 – exemption possible

**College Requirements:**

Comm 1313 and

3 hours communication elective selected from the following:

AGED 3142/3141L

CSES 3023 or any course from ENGL, JOUR, or COMM

Electives: 28 to 31 hours

**Departmental Requirements: 55-56 hrs**

CSES/ENSC 1012 – Orientation to Crop, Soil and Environmental Sciences

MATH 2043 – Survey of Calculus

BOTY 1613/1611L or

CSES 1203 – Plant Biology/Lab or Intro Plant Sciences

CHEM 2613/2611L – Organic Physiological Chem/Lab

MBIO 2013/2011L – General Microbiology/Lab

AGST 4023 or

STAT 2023 or

STAT 2303 – Prin of Experimentation or

Biostatistics or

Principles of Statistics

PHYS 2013/2011L – College Physics I/Lab

Select 9 hours from Environmental Sciences:

ENSC 1003 – Environmental Science (required)

AGECE 3413 – Principles of Environmental Economics

AGECE 4413 – Econ of Environmental Management

BIOL 3863/3861L – General Ecology

BIOL 4503 – Ecosystem Ecology

BIOL 485V – Field Ecology

ENSC 3253 – Septic Systems

ENSC 400V – Special Problems

GEOL 1113/1111L – General Geology/Lab

GEOG 3003 – Conservation of Natural Resources

GEOG 4543 – Geographic Info. Sys.

Select 11 hours from Soil Science:

CSES 2203/2201L – Soil Science/Lab (required)

CSES 3214/3210D – Intermediate Soil Science/Disc

CSES 355V – Soil Profile Description (1–2 hours)

CSES 4224/4220L – Soil Fertility/Lab

CSES 4253/4250L – Soil Classification and Genesis/Lab

CSES/ENSC 4263 – Env. Soil Sci.

Select 9 hours from Water Science:

ENSC 4023/4020L – Water Quality/Lab (required)

ENSC 3263/3260L – Envir. Soil and Water Conservation/Lab

AGME 4973 – Irrigation

AGME 4983 – Agricultural Meteorology

GEOL 4033 – Hydrogeology

GEOL 4043 – Water Resource Issues

GEOG 4353 – Elements of Weather

ZOOL 4814 – Limnology

Environmental science courses transferred from Northwest Arkansas Community College, Westark Community College and the University of Arkansas at Little Rock can be used to fulfill selected ESWS requirements. Consult an academic adviser to verify transfer applicability.

**Requirements for a minor in crop management (CPMG):**

18 semester hours of 2000-level courses or above including CSES 2103 and CSES 2203 and an additional 12 hours from the courses listed below, including at least two courses from Group A.

Group A:

CSES 3113, CSES 3312, CSES 3322, CSES 3332, CSES 3342

**Group B:**

CSES 2003, CSES 3214, CSES 4013, CSES 4103, CSES 4133, CSES 4143, CSES 4224 and CSES 4234.

A student planning to minor in crop management must notify the department of crop, soil, and environmental sciences and consult an adviser.

**Requirements for a minor in environmental, soil, and water science (ESWS):**

18 semester hours of courses to be selected from the following three categories

**Category 1: Environmental science (6 hours)**

to include ENSC 1003 and  
3 additional hours from AGECE 3413, AGECE 4413,  
BIOL 3863/3861L, BIOL 4503, BIOL 485V, ENSC 3253,  
ENSC 400V, GEOL 1113/1111L, GEOG 3003, GEOG 4543

**Category 2: Soil science (6-7 hours)**

to include CSES 2203 and  
3 to 4 additional hours from CSES 3214, CSES 4224,  
CSES 4253, CSES/ENSC 4263

**Category 3: Water science (6 hours)**

to include ENSC 4023 and  
3 additional hours from AGME 4973, AGME 4983,  
ENSC 3263, GEOL 4033, GEOL 4043, GEOG 4353,  
ZOO 4814.

A student planning to minor in environmental, soil, and water science should notify the department of crop, soil, and water sciences and consult with an academic adviser.

**Requirements for a minor in pest management (PMGT):**

See page 90 for requirements.

**Requirements for a minor in global agricultural, food and life sciences (AFLS):**

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGE 274 FOR CROP, SOIL AND ENVIRONMENTAL SCIENCE (CSES) COURSES AND SEE PAGE 285 FOR ENVIRONMENTAL SCIENCE (ENSC) COURSES .

**ENTOMOLOGY (ENTO)**

Frederick M. Stephen  
Interim Head of the Department  
320 Agriculture Building  
575-2451

- University Professors Meisch, Stephen
- University Professor Emeritus Musick, Phillips, Yearian
- Professors Johnson (D.T.), Kring, Luttrell, McLeod, Steelman, Steinkraus, Young
- Professors Emeriti Lancaster, Mueller, Tugwell, Warren
- Adjunct Professors Burleigh, Hendrix, Johnson (D.R.), Katayama, Teague, Thompson
- Assistant Professors Goggin, Szalanski
- Adjunct Assistant Professor Lorenz
- Research Assistant Professor Bernhardt

Entomology is the branch of science concerned with the study of insects and related organisms. It involves studies of their biology, structure, identification, economic significance, and population management. The major emphasis of the curriculum is an integrated approach to insect-pest management leading to ecologically and economically sound solutions to complex insect pest problems.

Entomology is a graduate degree. Undergraduate students interested in entomology should pursue a B.S.A. in pest management. See page 75 for degree requirements. A minor in entomology is also available.

**Requirements for a minor in entomology (ENTO):**

A minimum of 19 semester hours in entomology to include ENTO 3013, ENTO 4024 and ENTO 4123. Select three additional courses from ENTO 4013, ENTO 4033, ENTO 4043, ENTO 4053 and ENTO 4133.

**Requirements for a minor in global agricultural, food and life sciences (AFLS):**

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGE 285 FOR ENTOMOLOGY (ENTO) COURSES.

**ENVIRONMENTAL, SOIL, AND WATER SCIENCE (ENSC)**

Department of Crop, Soil, and Environmental Sciences  
J.L. Barrentine  
Head of the Department  
115 Plant Science Building  
575-2354

David M. Miller  
Program Coordinator  
106 Agriculture Building  
575-2354

Students interested in a B.S.A. degree in environmental, soil, and water science will find the requirements listed in the department of crop, soil, and environmental sciences section.

SEE PAGE 285 FOR ENVIRONMENTAL, SOIL, AND WATER SCIENCE (ENSC) COURSES.



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**FOOD SCIENCE (FDSC)**


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R. Buescher  
 Head of the Department  
 Food Science Building  
 575-4605

- Distinguished Professor Morris (J.)
- University Professor Emeritus Kattan
- Professors Buescher, Crandall, Hettiarachchy, Howard, Johnson, Proctor, Siebenmorgen
- Professors Emeriti Davis, Gonzales, Sistrunk, Snyder
- Associate Professor Meullenet
- Adjunct Associate Professors Brady, Freeman, Howell, Li, Morris (M.), Prior, Pohlman
- Assistant Professor Wang
- Research Assistant Professor Yang
- Adjunct Assistant Professor Lehigh

Food Science is the discipline in which the engineering, biological and physical sciences are used to study the nature of foods, the causes of deterioration, the principles underlying food processing and the improvement of foods for the consuming public. Food Technology is the application of Food Science to the selection, preservation, processing, packaging, distribution, and use of safe, nutritious and wholesome food. A major in Food Science prepares students for a wide variety of interesting and challenging career opportunities with food companies and governmental agencies.

Students may choose one of two areas of concentration for their degree program: Food Science (FDSC) or Food Technology (FDTN). The Food Science concentration at the University of Arkansas is one of only 45 programs in the United States and the only one in Arkansas that provides a curriculum that is approved by the Institute of Food Technologists (IFT).

The Food Science concentration provides students with a strong background in the basic sciences and in advanced Food Science, which prepares them for graduate studies and careers in processing, research and development, quality control and assurance, value-added product development, sensory analysis, and food control and assurance, and food safety.

The Food Technology concentration provides students with an integrated background in food science and agribusiness and business. Students in the Food Technology concentration can readily complete a minor in agribusiness or business.

Ample elective hours exist in both concentrations to allow the selection of a minor in the Bumpers, Fulbright or Walton colleges.

**Requirements for a B.S.A. degree with a major in food science:**

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core requirements** to include:  
 BIOL 1543/1541L  
 CHEM 1103/1101L  
 ECON 2143 or AGECE 1103 and  
 AGECE 2103 for Food Science and Industry

**University Advanced Composition Requirement:**  
 ENGL 2003 - exemption possible

**College Requirements:**

COMM 1313 and  
 3 hours communication selected from  
 AGED 3142/3141L

ENGL 3053 for Food Science Concentration  
 Electives: 18 to 19 hours

**Departmental Requirements: 72-73 hours**

MBIO 2013/2011L

CHEM 1123/1121L and CHEM 2613/2611L

AFLS 1011 – Freshman Orientation

FDSC 1011 – Food Science Orientation

FDSC 3103/3100L – Principles of Food Processing/Lab

FDSC 4713/4710L – Food Product Development/Lab

**Requirements for Food Science Concentration (FDSC):**

CHEM 3813 – Intro to Biochemistry

MATH 1213 – Trigonometry

MATH 2554 – Calculus I

PHYS 2013/2011L – College Physics I

ISYS 2013 or STAT 2303 or

AGST 4023 – Statistics

HESC 3204 – Nutrition for Health Professionals and Educators

FDSC 4114/4110L – Food Analysis/Lab

FDSC 4124/4120L – Food Microbiology/Lab

FDSC 4201/4200L – Quality Evaluation and Control/Lab

FDSC 4304/4300L – Food Chemistry/Lab

FDSC 4413/4410L – Sensory Evaluation of Food/Lab

FDSC 4754/4750L – Engineering Principles of Food Processing/Lab

**Requirements for Food Technology Concentration (FDTN):**

MATH 2043 – Survey of Calculus

MATH 2053 – Finite Math

FDSC 1103 – Introduction to Food Science

FDSC 2503 – Food Safety and Sanitation

FDSC 3202 – Introduction to Food Law

FDSC 4302/4200L – Quality Evaluation and Control/Lab

FDSC 431V(3) – Internship

FDSC 4413/4410L – Sensory Evaluation of Food/Lab

ACCT 2013 – Intro to Acct Info I

ISYS 1121L – Intro to Computer Information Systems

ISYS 2013 – Business Statistics

MGMT 3563 – Mgmt. Concepts and Organizational Behavior or

AGECE 4313 – Agricultural Business Management

MKTT 3433 – Principles of Marketing or

AGECE 3303 – Food and Agricultural Marketing

and select 6 hours from:

ACCT 2023 – Intro to Acct Info II

MGMT 3743 – Human Resource Mgmt.

AGECE 2303 – Intro to Agribusiness

TLOG 3613 – Business Logistics

AGECE 4143 – Agricultural Finance or

any 3000 – 4000 Walton College of Business course

**Requirements for a minor in food science (FDSC):**

18 hours to include FDSC 3103, FDSC 4124, FDSC 4304 and 7 hours from FDSC 2503, FDSC 3202, FDSC 4114, FDSC 4203 or HESC 1213.

A student planning to minor in food science must consult a department of food science adviser.

**Requirements for a minor in global agricultural, food and life sciences (AFLS):**

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGE 287 FOR FOOD SCIENCE (FDSC) COURSES

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**HORTICULTURE (HORT)**


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David L. Hensley  
 Head of the Department  
 316 Plant Sciences Building  
 575-2603

- Distinguished Professor Emeritus Moore
- University Professor Emeritus Rom (R.)
- Professors Klingaman, Morelock, Murphy, Clark
- Professors Emeriti Bradley, Einert, Huang, McFerran, Martin
- Associate Professors Rom (C.), Evans, Richardson
- Associate Professors Emeriti King, Wheeler
- Research Associate Professors Robbins, Striegler
- Assistant Professors, Andersen, Cole, Karcher, Lindstrom, Richardson, Srivastava
- Assistant Professor Emeritus McDaniel

The department of horticulture offers two major degree plans: horticulture (HORT) and turf and landscape horticulture (TLHT).

Horticulture involves production, management, marketing, and use of ornamental crops (shrubs, trees, flowers and turf) and edible crops (vegetables and fruits) for the economic, aesthetic and nutritional well being of society. The horticulture major provides education in basic and applied sciences, arts and humanities, communication and leadership, business and economics, to provide an understanding of the underlying principles in plant growth and development, development and use of new technologies, and the actual operation of a horticultural enterprise. An internship in the industry to gain practical, hands-on experience is required. Job opportunities for horticulturists include horticulture crop production and management, horticulture merchandising and business, consulting, inspection, research, teaching, communications, allied industries serving horticultural producers, and developing private business. Advanced study may be required for some careers. Students pursuing the horticulture degree may choose to concentrate studies in one of three areas:

1. Horticulture Management and Production (HMAP)
2. Horticulture Science (HSCI)
3. Horticulture Merchandising (HMER).

The turf and landscape horticulture (TLHT) major blends broad training in turf and ornamental horticulture with a strong basis in science. This major also requires an internship in the industry to gain practical, hands-on experience. Students interested in careers related to golf course or sports turf management, or to the diverse landscaping industries have two concentration options:

- A) Turf Management (TMGM)
- B) Landscape Horticulture (LHRT).

Turf management students will be exposed to the many aspects of the turfgrass industry and receive specific training in horticulture, environmental sciences, pest management, business and communications. Landscape horticulture students will receive instruction in selection, care and use of plant materials as well as the skills of management for the residential, commercial or public landscapes.

Job opportunities for turf management graduates include golf course superintendent, sports field manager, turfgrass service companies, seed or sod production, green industry journalism, research, teaching or private consulting. Landscape horticulture graduates will be prepared for careers in the landscape management industry, landscape nurseries, landscape architectural firms, private and public gardens, and public agencies such as parks and recreation.

**Requirements for a B.S.A. degree with a major in horticulture:**

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core requirements** to include:

BOTY 1613/1611L

CHEM 1074/1071L (except HSCI concentration –  
 CHEM 1103/1101L)

3 hours from ECON 2143, ECON 2013, ECON 2023, or  
 AGEC 1103, AGEC 2103

**University Advanced Composition Requirement:**

ENGL 2003 - exemption possible

**College Requirements:**

COMM 1313 and

3 hours Communication Elective. See adviser for suggested list of courses.

Electives: 9-20 hours

**Departmental Requirements: 53-63 hrs**

AFLS 1011,

CSES 2203/2201L,

BOTY 4304/4300L

Select 3 hours from:

AGED 3142/3141L, AGED 4003,

COMM 2323, COMM 2351, COMM 3303 or COMM 3703

Select 3-4 hours from:

PHYS 1023/1021L, PHYS 2013/2011L, PHYS 2054 or

PHYS 1044, BIOL 3323/3321L or ANSC 3123

(Note: students must take the accompanying lab to courses)

Select 3 hours of environmental science, earth science, or geology: See adviser for suggested list of courses.

Select 3 hours from:

AGEC or BADM:

See adviser for suggested list of courses.

Select 3 hours from

CSES 2003, ENTO 3013 or PLPA 3004

14 hours of horticulture courses to include the following:

HORT 2003 – Principles of Horticulture

HORT 4403 – Plant Propagation

HORT 462V, HORT 463V, HORT 464V or

HORT 465V – Internship (3 hrs)

HORT 3901 – Horticultural Career Development

Select 3 hours from:

HORT 3103 - Woody Landscape Plants or

HORT 3113 - Herbaceous and Indoor Plant Materials

**Additional Requirements for Concentration A:**
**Horticulture Management and Production (HMAP)**

CHEM 2613/2611L

Select 3 hours from Turf and Landscape:

HORT 2303, HORT 4603 or HORT 4043

Select 3 hours from Edible Crops:

HORT 3303, HORT 4103/4100L

Select 6 hours from Plant Materials/Floriculture/Nursery/  
Greenhouse Crops:  
HORT 3103, HORT 3133, HORT 4503, HORT 4703, or  
HORT 4803

Select 3 hours from Pest Management:  
CSES 2003, ENTO 3013, or PLPA 3004

**Additional Requirements for Concentration B: Horticulture Science (HSCI)**

CHEM 1123/1121L, CHEM 2613/2611L  
MATH 2043 or MATH 2554

Select 3 to 4 hours from:  
BIOL 3323/3321L, ANSC 3123, PHYS 2013/2011L, PHYS 2054  
(a genetics and physics class are required in the HSCI  
concentration)

9 hours of HORT classes 3000 level or above

**Additional Requirements for Concentration C: Horticulture Merchandising (HMER)**

Select 12 hours from horticulture management and production:  
HORT 2303, HORT 3113, HORT 3303, HORT 3403,  
HORT 4033, HORT 4043, HORT 4103, HORT 4503,  
HORT 4703 or HORT 4803

Select 3-4 hours from  
ANSC 3123 or CSES 2003, ENTO 3013, PLPA 3004,  
AGME 3153, AGME 3102/3101L, AGME 4973, AGME 4983

Select 3-4 additional hours from the preceding areas or from  
BOTY 4104, CHEM 2613, PHYS 2013/2011L,  
PHYS 2054/2050L, BIOL 3323/3321L or any HORT course

Select 6 hours of business courses from:  
AGEC 2303, AGEC 3403, AGEC 3303, AGEC 3413,  
MGMT 3563,  
FINN 3043, FINN 3623,  
BLAW 2013,  
ACCT 2013,  
MKTT 3433, MKTT 3533, MKTT 4033, MKTT 4533,  
MKTT 4933, MKTT 4943,  
JOUR 3723,  
ISYS 2232, ISYS 3603,  
TLOG 3613 or TLOG 3623

Select 12 hours from AGEC, ACCT, BLAW, ECON, FINN,  
ISYS, MGMT or MKTT  
Students are encouraged to pursue an agricultural business or  
business minor.

**Requirements for a B.S.A. degree with a major in turf and landscape horticulture.**

(See page 44 for University Core and page 75 for B.S.A, require-  
ments)

35 hours of **University Core requirements** to include:  
BOTY 1613/1611L  
CHEM 1074/1071L

3 hours from:  
AGEC 1103, AGEC 2103,  
ECON 2013, ECON 2023, ECON 2143

**University Advanced Composition Requirement:**  
ENGL 2003 – exemption possible

**College Requirements:**

COMM 1313 and  
3 hours communication elective selected: See adviser for sug-  
gested list of courses  
Electives: 20-25 hours

**Departmental Requirements: 60-61 hrs**

AFLS 1011  
CHEM 2613/2611L  
CSES 2203/2201L  
BOTY 4304/4300L

Select 3-4 hours from:  
PHYS 1023/1021L, PHYS 2013/2011L, PHYS 2054,  
PHYS 1044,  
BIOL 3323/3321L or ANSC 3123  
(Note: students must take accompanying lab to courses)

Select 3 hours from AGECE or BADM:  
See adviser for suggested list of courses

10 hours of Horticulture  
HORT 2003 – Principles of Horticulture  
HORT 3103 – Woody Landscape Plants or  
HORT 3113 – Herbaceous and Indoor Plants  
HORT 3901 – Horticulture Career Development  
HORT 462V or HORT 464V – Internship (3 hrs)

**Additional Requirements for Concentration A: Turf Management (TMGM)**

21 hours from Turf Management and Soils to include:  
HORT 2303 – Intro to Turfgrass  
HORT 3403/3400L – Turfgrass Management  
HORT 4033/4030L – Landscape Installation  
HORT 4043 – Landscape Management  
HORT 4903/4900L – Golf and Sports Turf  
CSES 4224/4220L – Soil Fertility  
PLPA 3004/3000L – Plant Pathology  
AGME 3102/3101L – Turf Equipment or  
AGME 4973/4970L – Irrigation

**Additional Requirements for Concentration B: Landscape Horticulture (LHRT)**

HORT 2303 – Intro to Turfgrasses  
HORT 4033 – Landscape Installation  
HORT 4043 – Landscape Management  
HORT 4603 – Practical Landscape Planning  
HORT 3103/3100L – Woody Plants  
HORT 3133/3130L – Advanced Woody Plants or  
HORT 3113/3110L – Herbaceous Plants  
AGME 3153 – Surveying or  
AGME 3102/3101L – Turf and Landscape Equipment  
AGME 4973/4970L – Irrigation

Select 6 hours of Pest Management:  
CSES 2003/2000L  
ENTO 3013/3010L or PLPA 3004/3000L

**Requirements for a minor in horticultural production (HORT):**

**18 hours to include the following:**

HORT 2003/2000L, HORT 4403.

Select 9 hours from:

HORT 2303, HORT 4803, HORT 3303, HORT 4103,  
HORT 4503, or  
HORT 4703, HORT 401V.

Select 3 hours from

HORT 3103, HORT 3113 or HORT 3133

**Requirements for a minor in landscape design and urban horticulture (LHRT):**

18 hours to include HORT 2003, HORT 3103 or HORT 3113,  
HORT 4043, HORT 4603 or LARC Studio Course

Select 6 additional hours from:

HORT 2303, HORT 3103, HORT 3113, HORT 3403,  
HORT 4033, HORT 400V (MAXIMUM 3 HRS),  
HORT 4703, HORT 4503 or HORT 4403 or LARC 3734

**Requirements for a minor in turf management (TURF):**

19 hours to include the following:

CSES 2203/2201L.

Select 6 hours from HORT 2303, HORT 3403, 4033 or  
HORT 4903;

6 hours from ENTO 400V or HORT 3103 or HORT 4043.

Select 3 hours from AGME 4973/4970L, AGME 3102/3101L

**Requirements for a minor in global agricultural, food and life sciences (AFLS):**

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGE 298 FOR HORTICULTURE (HORT) COURSES.

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**PEST MANAGEMENT (PMGT)**

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Interdepartmental Major

Randy Luttrell, Program Coordinator

321 Agriculture Building

575-3154

- University Professors Kim, Meisch, Oliver, Riggs, Stephen, Talbert, Yearian
- Professors Barrentine, Correll, Gergerich, Johnson (D.T.), Kirkpatrick, Kring, Lee, Lim, Luttrell, McLeod, Rothrock, Rupe, Steinkraus, TeBeest, Tugwell, Young
- Associate Professors Fenn, Milus
- Assistant Professor Burgos
- Extension Specialists Cartwright, Coker, Lorenz
- Extension Specialist Spradley
- Extension Specialists Boyd, Johnson
- Extension Specialist Baldwin

The pest management major is an interdisciplinary program of study in the Departments of Crop, Soil, and Environmental Sciences, Entomology and Plant Pathology in the Bumpers College. The major

is coordinated by an interdepartmental steering committee. Although students may be advised by faculty in any of the three departments referenced above, they should contact the program coordinator to be assigned an appropriate adviser. The program is designed for those students seeking employment with various agriculturally related industries such as chemical, seed or biotechnology companies, state and federal research institutions, extension and regulatory agencies, private and public consulting firms, farmer's cooperatives, nurseries, home and garden centers, green house production firms and corporate farms. This degree program prepares students to work in an increasingly technical, rapidly growing segment of agriculture.

Effective management of pest problems requires a broad base of knowledge in the pest disciplines (entomology, plant pathology and weed science), in biological/physical sciences and crop management as well as practical field experience. This knowledge and experience is provided in the undergraduate pest management major. A broad range of electives allows students to personalize their program to fit specific interests. The program is also designed to prepare students who wish to pursue graduate studies (master's and doctoral degrees). Additional information is available on the pest management Web site.

**Requirements for a B.S.A. degree with a major in pest management.**

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core requirements** to include:

BIOL 1543/1541L

CHEM 1103/1101L

**University Advanced Composition Requirement:**

ENGL 2003 - exemption possible

**College Requirements:**

COMM 1313 and

3 hours Communication elective selected from the following:

AGED 3142/3141L – Agri Communications/Lab

CSES 3023 – Agronomy Colloquium

ENGL 3053 – Technical and Report Writing

COMM 2351 – Parliamentary Procedure

COMM 2323 – Interpersonal Communication

AGED 4003 – Issues in Agriculture

COMM 2303 – Public Speaking

Electives: 21-26 hours

**Departmental Requirements: 58-60 hrs**

AGST 4023 – Principles of Experimentation

CHEM 1123/1121L – University Chemistry II/Lab and

CHEM 2613/2611L – Organic Physiological Chem/Lab

BIOL 3323/3321L – General Genetics/Lab or

ANSC/POSC 3123 – Principles of Genetics

Select 12 hours from:

BOTY 1613/1611L – Plant Biology/Lab or

CSES/HORT 1203 – Introduction to Plant Sciences

MBIO 2013/2011L – General Microbiology/Lab

PHYS 2013/2011L – College Physics I/Lab

BOTY 4304 – Plant Physiology

CSES 4013 – Advanced Crop Sciences

And the following courses in pest management:

CSES 2103 – Crop Science or

HORT 2003 – Principles of Hort.

CSES/ENTO/PLPA 4093 – Issues in Pest Management

CSES/ENTO/PLPA 462V (3 hrs) – Internship in Pest Mgmt.



CSES 2203/2201L – Soil Science/Lab  
 CSES 2003 – Intro to Weed Science  
 ENTO 3013 – Intro to Entomology  
 PLPA 3004 – Principles of Plant Path

Select 9-10 hours from the following, with at least one course from each area (CSES, ENTO and PLPA)

CSES 4133 – Weed ID, Morphology and Ecology  
 CSES 4143 – Prin of Weed Control  
 ENTO 4024 – Insect Diversity and Taxonomy  
 ENTO 4053 – Insect Ecology  
 ENTO 4123 – Insect Pest Mgmt I  
 ENTO 4133 – Advanced Applied Entomology  
 PLPA 4103 – Plant Disease Control

**Requirements for a minor in pest management (PMGT):**

20-21 hours to include CSES 2003, ENTO 3013 and PLPA 3004.

In addition, students must select one course from each area: CSES 4143 or CSES 4133; ENTO 4024, ENTO 4123 or 4133; and PLPA 4103. Students planning to minor in pest management must declare their intention to the Program Coordinator.

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**PLANT PATHOLOGY (PLPA)**

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Sung M. Lim  
 Head of the Department  
 217 Plant Sciences Building  
 575-2446

- University Professor Riggs
- University Professor Emeritus Scott
- Professors Correll, Gergerich, Kirkpatrick, Lee, Lim, Robbins, Rothrock, Rupe TeBeest, Weidemann
- Professors Emeriti Dale, Fulton, Jones, Kim, Scott
- Associate Professors Fenn, Milus, Yang
- Assistant Professor Korth
- Research Associate Professor Cartwright
- Adjunct Assistant Professors Jia, Vann

Plant pathology as a discipline seeks to understand the interrelationships of plants with the abiotic and biotic agents that affect plant health and productivity with the goal of minimizing the impacts of plant diseases on agricultural production and human health. Scientific training within the department focuses on the nature, cause and management of plant diseases caused by fungi, bacteria, viruses and nematodes.

Plant pathology is a graduate degree program. Undergraduate students interested in plant pathology should pursue a B.S.A. degree in pest management. See page 75 for degree requirements. A minor in plant pathology is also available to undergraduate students.

**Requirements for a minor in plant pathology (PLPA):**

19 hours to include PLPA 3004, PLPA 400V and PLPA 4103. The remaining 9 hours to be selected from the following: BIOL 4353, BOTY 4304, BOTY 4424, and MBIO 4233, MBIO 4753. A student planning to minor in plant pathology should notify the department of plant pathology and consult an adviser.

SEE PAGE 322 FOR PLANT PATHOLOGY (PLPA) COURSES

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**POULTRY SCIENCE (POSC)**

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Walter G. Bottje  
 Interim Head of the Department  
 0114 Poultry Center  
 575-3699

- Distinguished Professor Emeritus Forsythe
- University Professor Waldroup (P.W.)
- University Professors Emeriti Gyles, Nelson
- Professors Anthony, Bottje, Chapman, Coon, Denton, Hargis, Kirby, Kuenzel, Slavik, Wideman
- Professors Emeriti Andrews, Beasley, Harris
- Research Professors Donoghue (A.), Huff (W.), Jones, Rath
- Adjunct Professors Bristol, Keck, Plue, Porter, Rhoades, Steelman, Waldroup (A.)
- Associate Professors Emmert, Erf, Goodwin, Li, Parcels
- Research Associate Professors Clark, Marcy, Watkins
- Adjunct Associate Professors Story, Meullenet
- Assistant Professors Donoghue (D.), Kwon, Okimoto, Owens
- Research Assistant Professors Balog, Bramwell, Huff (G.), Newberry
- Adjunct Assistant Professors Breeding, Cook, Davis, Fussell
- Adjunct Research Assistant Professor Pumford

A major in poultry science is designed to provide the scientific and technical education to prepare students for positions of leadership and responsibility in the expanding fields of production, processing, marketing and distribution of meat, eggs and related poultry products. The curriculum also prepares students for career opportunities in specialized areas of nutrition, breeding and genetics, physiology, management, food science, immunology and disease.

Ample elective hours allow students to select a minor and thus personalize their degree. Elective hours can also be used to emphasize areas of business, production, processing or science. Pre-veterinary medicine or pre-medical or pre-pharmacy requirements may be fulfilled while meeting degree requirements.

Curricula are designed to permit the student to obtain the necessary foundation to pursue graduate study for the master's and doctoral degrees. Advanced degrees are offered but not limited to the areas of nutrition, genetics, physiology, product technology and poultry health.

**Requirements for a B.S.A. with a major in poultry science.**

(See page 44 for University Core and page 75 for B.S.A. requirements)

35 hours of **University Core Requirements** to include:

BIOL 1543/1541L  
 CHEM 1103/1101L

**University Advanced Composition Requirement:**

ENGL 2003 – exemption possible

**College Requirements:**

COMM 1313 and 3 hours Communication electives chosen from any of the following:

AGED 3142/3141L  
 COMM 2303, COMM 2323, COMM 3303, COMM 3703,  
 COMM 4323 or COMM 4343  
 ENGL 1213, ENGL 2013, ENGL 2023, or ENGL 3053  
 JOUR 1033

**Departmental Requirements: 48 hours to include**

CHEM 1123/1121L, CHEM 2613/2611L

STAT 2303  
 MBIO 2013/2011L  
 and the following poultry science courses:  
 POSC 1002L – Intro to Poultry Careers Lab  
 POSC 2353 – Broiler/Turkey Production  
 POSC 2363 – Breeder/Layer Management  
 POSC 2554 – Poultry Biology  
 POSC 3032 – Animal Physiology I  
 POSC 3042 – Animal Physiology II  
 POSC 3123 – Principles of Genetics  
 POSC 3223 – Poultry Diseases  
 POSC 4213 – Integrated Poultry Mgmt.  
 POSC 4314 – Egg and Meat Tech.  
 POSC 4343 – Poultry Nutrition  
 POSC 4901 – Undergraduate Seminar

#### Requirements for a minor in poultry science (POSC):

19 semester hours in courses above the freshman level to include POSC 2353 or POSC 2363 and POSC 3223, POSC 4314, POSC 4213, POSC 4343 and 3 hours POSC elective. A student planning to minor in poultry science should consult a departmental adviser.

#### Requirements for a minor in global agricultural, food and life sciences (AFLS):

Students must successfully complete 18 hours of regular courses, including 15 hours of required courses and 3 hours of elective courses as described on page 80. No other program component is required for this minor.

SEE PAGE 324 FOR POULTRY SCIENCE (POSC) COURSES

## SCHOOL OF HUMAN ENVIRONMENTAL SCIENCES (HESC)

Mary M. Warnock  
 Director  
 118 Home Economics Building  
 575-4305

- Professors Anderson, Farmer, Martin, Warnock, Whan
- Professors Emeritae Burton, Carroll, Cotton, Kenney, McCoy, Voth
- Associate Professors Bailey, Gentry, Noble, Turner
- Assistant Professors Apple, Fitch-Hilgenberg, Foote, Gloeckler, Killian, Miller, Myres, Takigiku, Webb
- Assistant Professors Emeritae Cunningham, Noyce, Raymond
- Instructors Baldwin, Crandall, Loewer, Smith, Young

The School of Human Environmental Sciences at the University of Arkansas prepares students for a wide variety of professional careers in education, industry, business, government and community services. The School is concerned with improving the quality of life for individuals and families as they exist and function in society. Human environmental sciences draws knowledge from its own research, from the physical, biological, and social sciences, and from arts and humanities. It relates this knowledge to an understanding of individuals' and families' needs and goals for food, clothing, shelter, management of resources, and human development and relationships. The School of Human Environmental Sciences has made a substantial contribution to the development of individuals and families through undergraduate and graduate preparation of human envi-

ronmental scientists and through research in human nutrition, foods, human development, family sciences, interior design, clothing and textiles.

### Human Environmental Sciences Majors and Minors

Students pursuing the bachelor of science degree in human environmental sciences (B.S.H.E.S.) may choose one of four majors. These programs have been accredited by the Council for Professional Development of the American Association of Family and Consumer Sciences. The four majors are as follows:

#### 1. Food, Human Nutrition and Hospitality (FHNH)

Concentration A: Dietetics (DIET)

Concentration B: General Foods and Nutrition (GFNU)

Concentration C: Hospitality & Restaurant Mgmt. (HRMN)

#### 2. Apparel Studies (APST)

#### 3. General Human Environmental Sciences (HESC)

#### 4. Human Development, Family Sciences & Rural Sociology (HDFS)

Concentration A: Child Development (CDEV)

Concentration B: Lifespan (LSPN)

#### Interior Design (IDES)

Students pursuing the bachelor of interior design (B.I.D.) degree must major in interior design (IDES). This program is accredited by the Foundation for Interior Design Education Research (FIDER).

Two minors are offered in human environmental sciences: human development, family sciences and human nutrition. Specific course requirements for the minors are listed at the end of the curriculum sections. Students may also minor in journalism as well as other select minors in the J. William Fulbright College of Arts and Sciences or the Sam M. Walton College of Business.

For information concerning graduate programs in human environmental sciences, consult the Graduate School Catalog. The Global Agricultural, Food and Life Sciences minor is offered in Dale Bumpers College of Agricultural, Food and Life Sciences.

#### Requirements for a bachelor of science in human environmental sciences (B.S.H.E.S.)

	HOURS
1. A total of 124 semester hours with a 2.00 cumulative GPA.	
2. A minimum of 39 hours of courses 3000 level or above	
3. University Core Requirements	35
See page 44 for requirements. Check requirements for each major. Some require specific core courses.	
<b>NOTE:</b> ENGL 2003 will not count as part of the total number of hours for a degree in the food, human nutrition and hospitality curriculum.	
4. Other University Requirements	3
Advanced Composition Requirement (see page 43)	
If exempt from advanced composition, 3 hours of ENGL, COMM, JOUR or Foreign Language are required. See specific major requirements	
5. College Requirements	3
COMM 1313	
6. Electives	4 - 23
Electives can be used to develop a minor	
7. School Requirements	64 - 78
See specific majors and concentrations	

## FOOD, HUMAN NUTRITION AND HOSPITALITY (FHNH)

The curriculum in food, human nutrition and hospitality allows students to prepare for a career in a specialized area of foods and nutrition by completing a common set of basic courses and one of the concentrations:

- A: dietetics (DIET);
- B: general foods and nutrition (GFNU) and
- C: hospitality and restaurant management (HRMN).

Interest and aptitude for the biological and physical sciences that support nutrition science are needed to complete concentrations A and B successfully. Concentration C is the best choice for those students who have an interest in management and who enjoy working with people.

**Concentration A - Dietetics (DIET):** This concentration is for the student whose goal is to become a registered dietitian (RD). Courses required include those necessary as prerequisites to a dietetic internship. An internship is required for eligibility to take the national registration examination and for eligibility for licensure. Students who complete the program with a minimum grade point average of 3.0 may apply for an internship. Upon licensure, students practice as registered dietitians in the health care field or as consulting dietitians in private practice, sports nutrition or in wellness and health maintenance centers. Students with lower GPAs may apply for supervised practice programs leading to the dietetic technician registered (DTR) certification.

**Concentration B - General Foods and Nutrition (GFNU):** Students taking this concentration are encouraged to select an approved minor from the Bumpers, Walton or Fulbright colleges or plan other combinations of courses to prepare for non-traditional vocations including work in community or government sponsored programs, wellness and health maintenance centers, public relations in the food industry, TV/media outlets for food and nutrition information, and international food or nutritional programs.

**Concentration C - Hospitality and Restaurant Management (HRMN):** Students in the hospitality and restaurant management concentration prepare themselves for managerial positions in the restaurant and hospitality industry. This dynamic curriculum provides students with skills in foods and business, as well as hospitality and restaurant management. Students have the opportunity to manage and operate a restaurant on campus. Students obtain hands-on experience by completing 1,000 hours of satisfactory, verifiable work experience in the hospitality and restaurant industry, usually completed during the summer and on part-time jobs during the school year. This noncredit work experience must be completed prior to graduation. A management internship, which allows students to acquire practical management experience and specialized knowledge from supervised work in a hotel, restaurant or other hospitality-related business, is also part of this degree. Students in this program can complete a minor in business.

### Requirements for a B.S.H.E.S. degree with a major in food, human nutrition and hospitality.

See page 44 for University Core and page 94 for B.S.H.E.S. requirements.

- 35 hours of **University Core requirements** to include:  
HESC 2413  
PSYC 2003

**Concentration A (DIET) and B (GFNU) to include:**  
CHEM 1103/1101L  
CHEM 1123/1121L  
MATH 1203 or MATH 1213

**Concentration C (HRMN) to include:**  
Either the two chemistry classes listed above or  
CHEM 1074/1071L  
BIOL 1543/1541L

**University Advanced Composition Requirement:**  
ENGL 2003 – exemption possible

**College Requirement:**  
COMM 1313  
Electives: 5 - 19 hours  
(Highly recommended for Concentration B: EXED 3023;  
for Concentration C: foreign language and HLSC 3633.)

**School Requirements: 68 - 81 hours**  
PEAC or DEAC – 2 hrs  
HESC 1501 – Orientation to HESC  
HESC 1213 – Nutrition in Health  
HESC 2112/2111L – Foods I/Lab  
HESC 3604 – Food Prep for Hospitality Industry  
HESC 3653 - Food Systems Mgmt.  
HESC 4103 - Experimental Foods  
HESC 4303 - Professional Development in HESC

**Requirements for Concentrations A: Dietetics and B: General Foods and Nutrition**  
ENGL 3053 or JOUR 3123 or AGED 3142/3141L  
MBIO 2013/2011L  
CHEM 2613/2611L and CHEM 3813  
ISYS 1121L  
ZOO 2213/2211L and ZOO 2443/2441L or  
BIOL 1543/1541L and ANSC 3032 and ANSC 3042  
HESC 3204 – Nutrition for Health Professionals and Educators  
HESC 3213 – Dietetic and Nutrition Practice  
HESC 4213 – Advanced Nutrition  
HESC 4223 – Nutrition/Life Cycle  
HESC 4243 – Community Nutrition  
HESC 425V (1 hr) – Seminar

**Additional Requirements for Concentration A: Dietetics**  
HESC 1201 - Introduction to Diet and Nutrition  
AGST 4023 and MGMT 3563  
HESC 4264/4260L - Medical Nutrition Therapy I/Lab  
HESC 4273 - Medical Nutrition Therapy II  
HESC 4613 - Food Service Purchasing  
HESC 4623 - Selection and Layout of Food Service Equipment  
MGMT 3563 - Mgmt. Concepts and Organizational Behavior

### Additional Requirements for Concentration B: General Foods and Nutrition

HESC 1201 - Introduction to Diet and Nutrition and/or  
HESC 1603 - Introduction to Hospitality

### Requirements for Concentration C: Hospitality and Restaurant Management

HESC 1603 - Introduction to Hospitality  
BLAW 2013 and AGED 3142/3141L  
ECON 2013 and ECON 2023 or  
AGEC 1103 and AGECE 2103  
MATH 2043 and MATH 2053

(Math 1203, prerequisite for MATH 2043 and MATH 2053, required for hospitality and restaurant management students who do not have the required math proficiency.)

ACCT 2013 and ACCT 2023

ISYS 1121L and ISYS 2232 and ISYS 2013

FINN 3043 and MGMT 3563 and MGMT 3743 and MKTT 3433

FDSC 2503 - Food Safety/Sanitation

HESC 2120L - Catering for Healthy Lifestyles Lab

HESC 2123 - Catering for Healthy Lifestyles

HESC 4613 - Food Service Purchasing

HESC 4623 - Selection and Layout of Food Service Equipment

HESC 4693 - Hospitality Internship

**Requirements for a minor in nutrition (General Foods and Nutrition): 18-19 hrs**

HESC 1213, HESC 2112/2111L, HESC 3204 and HESC 4213.

Select 5-6 hours from HESC 4223, HESC 4243 and HESC 425V  
(1 hour may be taken twice)

**APPAREL STUDIES (APST)**

The apparel studies program opens the door to careers in the fashion industry. Buyer, product development specialist, fashion coordinator, sales consultant, visual display artist, and quality assurance technician are only a few of the possibilities. Classes in business, retailing, apparel production, science, social science, and the liberal arts give students a basic knowledge about the textile and apparel industries. By selecting from a variety of minors, students can tailor this program to meet their goals. Program strengths include guest speakers who provide insight into today's careers, tours of major fashion centers and internships which provide valuable career experience.

**Requirements for a B.S.H.E.S. degree with a major in apparel studies.**

(See page 44 for University Core and page 94 for B.S.H.E.S. requirements)

35 hours of **University Core requirements** to include:

CHEM 1074, 1071L and BIOL 1543, 1541L

(Two semesters of chemistry, CHEM 1103/1101L and CHEM 1123/1121L, may be substituted for CHEM 1074/1071L.)

PSYC 2003

ECON 2143

ANTH 1023 or SOCI 2013

ARTS 1003

Select 3 hours from University Core Humanities (section B, C, or D)

**University Advanced Composition Requirement:**

ENGL 2003 – exemption possible

**College Requirement:**

COMM 1313

Electives: 15 hours (Suggested elective minor areas are marketing, journalism, drama, art or art history.)

**School Requirements: 64 hours**

MATH 2053

MKTT 3433

Select 3 hours from the following:

ISYS 1121L and ISYS 2232 or AGME 2903 or CSCE 1003

Select 6 hours of any Foreign Language (not to be used as exemption for ENGL 2003)

Select 52 hours of HESC courses:

HESC 1501 – Orientation

HESC 1013 – Intro to Clothing Concepts

HESC 1023 – Intro to Apparel Production

HESC 1053 – Computer Based Methods

HESC 2013 – Quality Assess of Apparel

HESC 2023 – Visual Merchandising

HESC 2053 – Intro to Textile Science

HESC 3003 – Apparel Production

HESC 3013 – Intro Fashion Merchandising

HESC 3033 – Apparel Merchandising

HESC 4023 – Merchandising Methods

HESC 4043 – History of Apparel

HESC 4053 – Contemporary Apparel

HESC 4063 – Advanced Apparel Production

HESC 4073 – Internship

HESC 4303 – Professional Development

HESC 1213 – Nutrition in Health

HESC 2413 – Family Relations

**GENERAL HUMAN ENVIRONMENTAL SCIENCES (GHES)**

The general human environmental sciences curriculum serves students seeking a background in all of the subject-matter areas of human environmental sciences. The general curriculum prepares students for careers in social services, business and the Cooperative Extension Service. Liberal elective hours allow students to select courses and programs to meet individual needs.

Students may be certified by the Arkansas State Board of Education to teach family and consumer sciences in Arkansas public schools by combining the pre-professional education courses as electives and completing the master of arts in teaching (M.A.T.) degree requirements. (See M.A.T., page 171). At the beginning of the sophomore year, students should consult with their adviser to schedule the general education and pre-professional education courses.

**Requirements for a B.S.H.E.S. degree with a major in general human environmental sciences.**

See page 44 for University Core and page 94 for B.S.H.E.S. requirements.

35 hours of **University Core Requirements** to include:

CHEM 1074/1071L

(Two semesters of chemistry, CHEM 1103/1101L and CHEM 1123/1121L, may be substituted for CHEM 1074/1071L.)

BIOL 1543, 1541L

PSYC 2003

Plus two courses to meet state minimum social sciences core

ARTS 1003

Select 3 hours from

PHIL 2003, PHIL 2103, PHIL 2203 or WLIT 1113, WLIT 1123

ENGL 1013, ENGL 1023

**University Advanced Composition Requirement:**

ENGL 2003 - exemption possible

**College Requirement:**

COMM 1313

Electives – 12-14 hours

HIST 2003, HIST 2103, or PLSC 2003

MATH 1203 or MATH 1213



(Students wishing to qualify for the M.A.T. need six hours of English, World Literature or American Literature and three hours of Western Civilization or World Civilization.)

**School Requirements: 46 hours**

General Electives: 31-33 hours  
CHEM 2613/2611L  
1- to 3-hour computer class  
PEAC 1621  
HLSC 1002

Select 43 hours of HESC courses:

HESC 1013 – Intro to Clothing Concepts  
HESC 1023 – Intro to Apparel Prod  
HESC 1213 – Nutrition in Health or  
HESC 3204 – Nutrition Health Prof. And Ed.  
HESC 1403 – Lifespan Development  
HESC 1501 – Orientation  
HESC 2053 – Intro Textile Science  
HESC 2112/2111L – Foods I/Lab  
HESC 2123/2120L – Catering/Healthy Lifestyles/Lab  
HESC 2413 – Family Relations  
HESC 3402 – Child Guidance  
HESC 4753 – Family as Consumers  
HESC 3763L – Family Resources Mgmt. Lab  
HESC 4813 – Human Factors in ID  
HESC 4303 – Professional Development  
HESC 4453 – Parenting/Family Dynamics

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**HUMAN DEVELOPMENT, FAMILY SCIENCES  
AND RURAL SOCIOLOGY (HDFSRS)**

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Students majoring in human development and family sciences prepare for one of the fastest growing employment opportunities in the country. The human services area includes jobs that serve people from conception through the last stages of life. Students develop skills for working with individuals and families in governmental, private, and nonprofit organizations. Two concentrations are offered:

**Concentration A: Child Development (CDEV)**

This concentration is for students who desire in-depth knowledge of children and programs for children from birth to age 12. The focus on children covers issues from the prenatal to early adolescent period in the lifespan. Graduates are working as preschool teachers, daycare directors, specialists in the field of child life and as child advocates.

**Concentration B: Lifespan (LSPN)**

This area of study covers the care issues faced by families and individuals in contemporary society. The knowledge and skills developed in this program will prepare the student to work in areas such as aging, parent education, financial and consumer counseling, youth services and other human service type careers.

**Requirements for a B.S.H.E.S. degree with a major in human development and family sciences.**

See page 44 for University Core and page 94 for B.S.H.E.S. requirements.

35 hours of **University Core Requirements** to include:

BIOL 1543/1541L  
4 hours from ASTR, CHEM, GEOL or PHYS  
PSYC 2003  
SOC 2013 or RSOC 2603

**University Advanced Composition Requirement:**

ENGL 2003 - exemption possible

**College Requirement:**

COMM 1313  
Electives: 15 - 16 hours

**School Requirements: 67 - 68 hours**

3 hours from AGECE 1103, AGECE 2103, ECON 2013,  
ECON 2143 or ECON3053  
3 hours from ISYS 1121L and ISYS 2232, AGME 2903  
or ETEC 2001/2002L  
HLSC 3633

Select 22 hours of HESC courses:

HESC 1501 – Orientation  
HESC 1213 – Nutrition in Health  
HESC 2413 – Family Relations  
HESC 2433 – Child Development  
HESC 3423 – Adolescent Development  
HESC 4423 – Adult Development  
HESC 4753 – Family as Consumers  
HESC 4303 – Professional Dev in HESC  
HESC 4453 – Parenting/Family Dynamics

**Additional Requirements for Concentration A:**

**Child Development**

HESC 2402/2401L – Infant and Toddler Development/Lab  
HESC 3402/3401L – Child Guidance  
HESC 4463 – Admn and Evaluation of Child Dev Programs  
HESC 4472/4472L – Child Development Practicum/Lab  
CIED 3023 – Survey of Exceptionalities  
CIED 3103 – Children’s Literature  
CIED 3113 – Emergent and Developmental Literacy  
SCWK 3633 – Problems of Child Welfare

Select 12 hours from the following:

HESC 3443 – Families in Crisis  
HESC 3763 L – Family Resource Management  
HESC 4433 – Dynamic Family Interaction  
HESC 4483 – Internship in HDFS  
(requires a GPA of 2.75 or higher)  
HESC 4493 – Public Policy Advocacy  
HESC 4223 – Nutrition/ Life Cycle  
CIED 3263 – Language Development for the Educator  
Any courses in HDFSRS not listed in this concentration or in the HDFS core may also be included as electives in this section.

**Additional Requirements for Concentration B: Lifespan**

HESC 1403 – Lifespan Development  
HESC 3443 – Families in Crisis  
HESC 4433 – Dynamic Family Interaction  
HESC 4443 – Gerontology  
HESC 4493 – Public Policy Advocacy  
SCWK 3163 – Death and Dying

Select 3 hours of statistics from PSYC 2013 or  
SOC 3303/3301L or ISYS 2013

Select 3 hours research methods from PSYC 3073 or SOC 3313

Select 12 hours from HESC 3763L, HESC 4483

(requires a GPA of 2.75 or higher), SOC 3233,

SOC 4133, CNED 3053, CDIS 4273 or COMM 3433

Any courses in HDFSRS not listed in this concentration or in the HDFS core can also be included as electives in this section.

**Requirements for a minor in human development and family sciences (HDFS):** 18 hours

HESC 1403 and HESC 2413

Select 12-13 hours from the following:

HESC 2402/2401L, HESC 2433,  
HESC 3402/3401L, HESC 3423, HESC 4423, HESC 4753,  
HESC 4443, HESC 4453, HESC 4463 or HESC 4472**INTERIOR DESIGN (IDES)**

Interior design, a FIDER accredited program, combines an excellent foundation of professional courses that are enhanced by classes in human environmental sciences, art, architecture and business. A goal of the program is to foster a sense of personal and professional responsibility. Students are actively involved in national design competitions and domestic and international travel. Field trip opportunities are offered on a regular basis, and students are expected to participate. Graduates are placed in residential, contract, and institutional interior design firms, architectural firms, art galleries, set design and contract and residential sales.

A sophomore portfolio review is an important component of the academic program. The review of studio work will occur in December of the sophomore year. The submitted materials will follow guidelines prepared by the interior design faculty and will include examples of work from Design I, Design II, Studio I, and Introduction to Presentation Media. All full-time interior design faculty will review portfolios. Students will receive a pass or probation. If the portfolio is acceptable (pass), the student may continue, without remediation or additional required work, to junior-level studios. To be removed from probationary status, the student must comply with faculty recommendations that may include repeating a course(s), taking supplemental courses to strengthen a weakness, or submission of reworked studio projects. Students on probation must resubmit a portfolio at the end of the spring semester following the initial review. In the event that skills are not improved, the student will not be permitted to progress into upper-level studios.

The studio sequence increases in complexity throughout the curriculum. The rigor of the program requires a significant commitment of time and energy. Students can expect to spend a minimum of 3 hours out of class for each hour of studio time to complete projects. Participation in an annual senior portfolio exhibition and a supervised internship experience are requirements for graduation. The faculty reserve the right to retain student work for accreditation and recruitment purposes.

Transfer students seeking advanced placement must submit a portfolio for faculty review prior to beginning any studio course. Review of portfolio will allow appropriate placement based on demonstrated skills. Students may be required to wait a semester for the appropriate studio sequence. Transfer students placed into the program prior to sophomore portfolio review will be required to participate in the sophomore review process.

A professional advisory board supports the program, and faculty and students participate in professional design association activities. The faculty are well qualified educators and practitioners who foster an attitude of inquiry and learning based on their individual skills and interest. Intellectual development of students is stimulated and leadership qualities enhanced throughout the four-year curriculum. The student chapter of the American Society of Interior Designers (ASID) allows for interaction with professionals in interior design and allied professions.

In response to industry demands, the program requires laptop computers. Students must acquire a laptop for use in studio courses that are taught in the spring semester of the second year of the pro-

gram. Specifications for laptops must be obtained from interior design faculty prior to purchase by the student.

**Requirements for a bachelor of interior design (B.I.D.)**

HOURS

1. A total of 124 semester hours with a 2.00 cumulative GPA.
2. A minimum of 39 hours of courses 3000-level or above
3. University Core Requirements 35  
See page 44 for core courses.  
Must include 3 hours from  
ECON 2013 or ECON 2023 or  
ECON 2143 or AGECE 1103 or  
AGECE 2013  
PSYC 2003  
SOC 2013  
Fine Arts (3 hours)
4. Other University Requirements 3  
ENGL 2003 Advanced Composition Requirement  
(see page 43).  
If exempt, must take 3 hours from  
COMM, JOUR, or ENGL courses
5. College Requirements 3  
COMM 1313
6. Electives 1
7. School Requirements 82

One ARTS studio elective and ARCH 4433  
6 hours of business courses to be selected from  
ACCT 2013, ISYS 1121L, ISYS 2232, FINN 3003,  
MGMT 3563, or BLAW 2013, MKTT 3433, FINN 3933

**NOTE:** At least two of the three courses in studio art and business must be 3000- or 4000-level to meet the college requirement of 39 upper-division hours.

**69 hours of HESC courses to include:**

HESC 1501 – Orientation to HESC  
HESC 2053 – Intro to Textile Science  
HESC 2413 – Family Relations  
HESC 4303 – Professional Development in HESC  
HESC 1031 – Design I  
HESC 1034 – Design I Studio  
HESC 1041 – Design II  
HESC 1044 – Design II Studio  
HESC 2803 – Studio I: Development of Interior Space  
HESC 2813 – Studio II: Design Process & Application  
HESC 2823 – ID Materials & Resources  
HESC 2833 – Introductory Presentation Media  
HESC 2841 – Lighting Studio  
HESC 2842 – Lighting Systems  
HESC 2883 – History of ID I  
HESC 2893 – Principles of Computer-Aided Design  
HESC 3803 – Studio III: Working Drawings and Building Sys  
HESC 3813 – Studio IV: Interiors for Public Use  
HESC 3823 – Human Factors in ID  
HESC 3863 – Advanced Presentation Media  
HESC 3883 – History of ID II  
HESC 4803 – Studio V – Advanced Residential Design  
HESC 4811 – Internship for ID  
HESC 4823 – Professional Practices  
HESC 4843 – Internship Preparation  
HESC 4863 – Studio VI – Commercial Design  
HESC 4891 – Senior Portfolio

SEE PAGE 292 FOR HUMAN ENVIRONMENTAL SCIENCES (HESC) COURSES.



# School of Architecture

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## Dean of the School

120 Vol Walker Hall  
575-2702

## Advising Center

209 Vol Walker Hall  
575-2399

## Dean

Jeff Shannon, M.Arch.  
Rice University

## World Wide Web

<http://uark.edu/~archsite/>

E-Mail: [genarad@uark.edu](mailto:genarad@uark.edu)

## PURPOSE AND OBJECTIVES

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The School of Architecture at the University of Arkansas houses the two professional design programs of architecture and landscape architecture. The School's programs combine traditional models of professional studio-design education with innovative teaching in history and theory, technology, and urbanism. A broad range of course offerings equips graduates with the knowledge required for the challenges of a changing world. Design instruction occurs in a carefully planned studio sequence, providing educational experiences appropriate for students who wish to pursue both traditional and non-traditional forms of professional practice. Fundamental principles and techniques of problem solving are stressed, and the curriculum strives to empower students by developing skill, knowledge, and a deep sense of responsibility to the cultures we serve. Design studio projects survey issues and opportunities in built and natural settings, as well as complex social, physical, and cultural relations that constitute the human-made environment.

## Accreditation and Membership

The architecture program was founded in 1946 and has been accredited by the National Architectural Accrediting Board (NAAB) since 1958. The landscape architecture program was established in 1975 and has been accredited by the American Society of Landscape Architects (ASLA) since 1983. The School holds memberships in the Association of Collegiate Schools of Architecture (ACSA) and the Council of Educators in Landscape Architecture (CELA), organizations comprised of North American schools of architecture and landscape architecture.

In the United States, most state registration boards require a degree from an accredited professional degree program as prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes two types of degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a six-year, three-year or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Master's degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

## ORGANIZATION, FACILITIES AND RESOURCES

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The department of architecture and the School's administrative offices are located in Vol Walker Hall, formerly the university's library building, which has been extensively remodeled to meet the needs of the department and School. The landscape architecture department is locat-



ed in Memorial Hall, formerly the university's student union.

The university's location in northwest Arkansas, an area experiencing rapid growth and change, affords unusual opportunity to study the impact of urbanization in a rural setting. The School includes as part of its programs field trips, guest lectures, research assignments, and other teaching techniques oriented toward major urban and rural problems as means to broaden the educational base of its students.

Classes are also offered in a variety of settings away from the campus. Options include a semester in the Rome Study Center for Architecture and the Humanities near the Piazza Navona in Rome, Italy; a six-week Landscape Architecture Study Abroad Program to England and Italy in summer; and the Mexico Summer Urban Studio.

### **University of Arkansas Community Design Center (UACDC)**

The School of Architecture provides community service opportunities through the University of Arkansas Community Design Center (UACDC). The Center was founded in 1995 with the support of the Harvey and Bernice Jones Charitable Trust. It is currently supported by the Arkansas Department of Economic Development and by a generous endowment from the Donald W. Reynolds Foundation.

The Center utilizes students, faculty, and professional staff to provide technical assistance to the towns and communities of the State of Arkansas in such areas as town and environmental planning, low and moderate income housing, and community and policy development. In addition to providing design leadership, the Center gives students the opportunity to work directly with leaders throughout the state to solve real problems in the context of actual situations and conditions.

The Center houses two separate programs: One occurs during the academic year when upper-level architecture and landscape architecture students may earn studio credits while providing valuable public service and a second program occurs during the summer when a faculty member and six to eight students live and work in selected communities.

### **Delta Research and Design Center**

The Delta Research and Design Center (DRDC), a unit of the University of Arkansas Community Design Center (UACDC), was established by one of two generous grants received from the Winthrop Rockefeller Foundation. The center, located in Clarendon, Arkansas, assists local communities in developing plans and programs to help them expand their economy, improve education, and develop ecotourism and conservation.

### **Design Studio**

The design studio sequence is the core of each discipline within the School of Architecture. Students spend three afternoons each week in a design studio, with complementary lecture courses taught to allow knowledge from those lectures to inform work produced in design studios. This method is designed to develop and nurture the intellectual and creative skills of students and to allow them to approach problem solving in a disciplined, logical and analytical manner.

Design professionals must be able to conceptualize responses to project programs, to communicate with clients, to present ideas verbally, and to demonstrate ideas graphically. They also need to maintain technical knowledge of building or ecology and construction technology, must be able to negotiate with contractors and owners to administrate construction, and should be prepared to market their services. In other words, each designer fulfills a multitude of roles, whether practicing alone or as a team member in a large multi-disciplined organization.

The design studio consists of a series of projects of increasing complexity, all requiring three-dimensional problem solving, conceptualization, and final presentation to the studio critic, other faculty members, and fellow students. The amount of material to be covered, the fast pace of assignments, and the pressure of critical reviews by faculty and other students combine to produce a highly charged studio atmosphere.

### **Library Resources**

The School of Architecture is served by the Fine Arts Library, a branch of the University Libraries. The collections in the Fine Arts Library include traditional print resources on the visual arts (painting, drawing, sculpture, ceramics, printmaking, and photography), architecture and landscape architecture. Types of materials include books, exhibition catalogs, reference books, and periodicals. Electronic resources supporting the art, architecture, and landscape architecture programs include Art Index, Avery Index, Bibliography of the History of Art, Grove Dictionary of Art among others. The Fine Arts Library also maintains course reserves for faculty wishing to place materials on reserve for their classes

A collection of over 80,000 slides and 750 videos relating to architecture, architectural history, landscape, and urban design is housed in the School's C. Murray Smart Media Center, which is located in Vol Walker Hall.

### **Garvan Woodland Gardens**

This 210-acre botanical garden located on Lake Hamilton in Hot Springs, Arkansas, is an integral unit of the School of Architecture. The land and endowment were the result of a bequest to the department of landscape architecture in 1985. A master plan outlining future development has been completed and is currently being implemented. The garden includes facilities designed by E. Fay Jones and Maurice Jennings, and a garden designed by David Slawson. Students participate in design projects in the garden.

### **DEGREES OFFERED**

The School of Architecture offers five-year professional programs in architecture and landscape architecture; each program culminates in a professional degree, the Bachelor of Architecture (B.Arch.) or Bachelor of Landscape Architecture (B. Landscape Arch.).

The Bachelor of Architecture prepares students who aspire to registration and licensure to practice architecture. Architects do more than design and plan buildings. The architect's unique talents create environments that serve the psychological, economic, and spiritual needs of their clients and communities. Architects help cities and small communities to become safe, healthy, and wholesome places to live. Perhaps most important, architects create, preserve, and inspire beauty in the built environment.

The Bachelor of Landscape Architecture is an accredited five-year first professional degree that prepares students to practice landscape architecture as a licensed professional. The discipline of landscape architecture balances human requirements with landscape concerns. Landscape architects design, plan, and manage the land through understanding the interrelationships among the spirit of place, local ecology, individuals, and communities. They create outdoor spaces and rebuild ecological systems that meet societal needs, protect or enhance the natural environment, and respond to cultural conditions. Design and planning projects span the breath of the profession to include urban design and town planning, public parks, land conservation, stormwater management systems, ecological rehabilitation, historic landscape preservation, private gardens, housing developments, institutional and business campuses, and golf courses.

The School also offers a four-year program culminating in a non-accredited degree, the Bachelor of Science in Architectural Studies with concentrations in architecture and landscape architecture.

### Minors

Students in architecture and landscape architecture may pursue an academic minor in approved degree programs of other colleges on campus, providing they meet the specific requirements for that minor.

### ADMISSION TO THE SCHOOL OF ARCHITECTURE

All students (including freshman, international, and transfer students) admitted to the University of Arkansas, Fayetteville, are eligible for participation in the pre-professional programs in the School of Architecture. The requirement for completion of the ARCH and LARC I and II design studios may be fulfilled by a two-semester, fall-spring sequence or by an equivalent and intensive 12-week summer program. Students may elect either, but enrollments in the fall studios are limited through competitive selection. Currently, 50 students are selected from all applicants interested in architecture, and 18 students are selected from all applicants interested in landscape architecture. Priority will be based on high school or transfer GPA, ACT, or SAT scores and given to those who make application prior to March 1. Applicants selected for the fall studio must attend the designated School of Architecture orientation to ensure a space in the fall-spring ARCH or LARC design studio sequence. Students entering the School of Architecture in the spring semester are highly encouraged to enroll in the intensive 12-week summer program. Those choosing not to do so will be considered and evaluated along with all incoming freshmen and transfer students for placement in the fall studio.

1. Students who require developmental work because of low ACT or SAT scores or University-administered math placement examinations or who require courses to remove deficiencies may not register for courses carrying ARCH or LARC departmental designations. Students entering the School of Architecture must take the University math placement exam unless he or she (1) has achieved an overall math composite score of 22 on the ACT exam, (2) have taken college algebra and trigonometry or pre-calculus at another institution of higher education. Architecture students taking the math placement exam must have scored 13 in algebra and 7 in trigonometry to be eligible for Architectural Design I and II and MATH 2043 or 2053. Landscape architecture students taking the math placement exam must have scored 13 in algebra and 7 in trigonometry to be eligible for Landscape Architecture Design I and II.
2. Upon completion of required developmental work and maintaining a grade-point average of 2.00 or more on at least 12 credit hours, students may enroll in architecture (ARCH) or landscape architecture (LARC) courses. Please refer to "Admission to the Professional Program in Landscape Architecture" for required academic levels for entering the program and the degree description for graduation requirements.

The following program is recommended in planning the first year of pre-professional work. (Course numbers refer to courses on the Fayetteville campus of the University of Arkansas.) This structure offers students from other majors and those from other institutions of higher education the option of transferring into the pre-professional programs after approximately one year of undergraduate study.

	HOURS
English composition	6
ENGL 1013, ENGL 1023	
Mathematics	3
MATH 2043 or MATH 2053 for architecture and MATH 1203 for landscape architecture	
Architectural (or Landscape Architecture) Design	10
ARCH 1015, ARCH 1025, or LARC 1315, LARC 1325	
History and Theory of Environmental Design	2
ARCH 1211, ARCH 1221 or LARC 1211, LARC 1221	
American National Government U.S. History, or Social Science	3
WCIV 1003, WCIV 1013 PLSC 2003 HIST 2003, HIST 2013 ANTH 1013 ECON 2013, ECON 2143 GEOG 2103, GEOG 2203 PSYC 2003 SOC 2013, SOCI 2033	
Science Core Requirement	8
PHYS 1044/1040L is required for architecture and PHYS 1054/1050L is strongly recommended for architecture and BOTY 1613/1611L, or BIOL 1543/1541L and GEOL 1113/1111L are required for landscape architecture.	

**NOTE:** The specific courses shown in this catalog as Architecture Design Studio I and II, Landscape Architecture Design Studio I and II, and Introduction to Architecture or Landscape Architecture I and II must be taken at the School of Architecture. Alternate courses recommended for students at other institutions may be substituted subject to approval. Students interested in the architecture program must have satisfied the MATH 2043 (Survey of Calculus) or MATH 2053 (Finite Mathematics) and PHYS 1044/1040L (Physics for Architects I) requirements prior to taking ARCH 2124.

### Transfer and International Students

Persons who have attended other accredited programs in architecture or landscape architecture should apply to the Advising Center, in the School of Architecture, enclose a transcript of work completed, and arrange an interview. Studio placement of transfer students will be made only after completion of a personal interview. To become eligible for advanced design studio placement, a transfer student must present a 3.00 grade-point average in all design studio work from another accredited program of architecture or landscape architecture. The appropriate faculty upon examination of a portfolio and/or other pertinent materials will consider exemptions from any curriculum requirement, as well as the transfer of professional course work. Consult the Advising Center regarding submittal requirements. School policy requires that, as a minimum, the final two years of design studio be completed at this School of Architecture.

International students must present a TOEFL score of 550 to become eligible for acceptance into the School. Lack of knowledge or misinterpretation of policies and/or regulations on the part of individual students will not be considered a valid reason for failure to fulfill requirements. Ultimate responsibility for completion of entrance requirements rests with each student.

## ADMISSION TO THE PROFESSIONAL PROGRAM IN ARCHITECTURE

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The department of architecture offers prospective students the opportunity to prepare for architectural practice or related endeavors. With this opportunity comes a responsibility for demonstrating a commitment to personal growth and success in the professional program.

Students are admitted to the first year of the architectural curriculum based on criteria established by the University and by the School of Architecture. They are evaluated by grades in course work and by grades each semester for performance and progress in the design studio sequence. It is the responsibility of faculty to advise all students for whom they are responsible on their potential for success in the professional program and beyond. These evaluations are subjective and speculative, however, and students will be responsible for the decision to proceed or not, except in circumstances in which department design review policy applies.

At the completion of the third year of the department of architecture curriculum, including completion of the 35 semester-credit hours of the University's general education core requirement, students may gain admission to the Professional Degree Program. The University Advanced Composition requirement must be completed either by course work or by exemption via an exam, prior to entry into the fifth year of the professional curriculum. Application documents are due in the architecture advising center by the first day of classes of the spring semester. Students will be evaluated for admission on the basis of academic performance in the architecture curriculum, demonstrated commitment to serious work, a sense of responsibility to the opportunities offered by the School of Architecture, and contributions to the school community. Students are required to submit a portfolio of design and academic work along with the names of two faculty advocates from School of Architecture. One is required from a design studio faculty member; the other is required from a faculty member who has worked with the student in architectural history or technology courses. These two faculty members should note that they are willing to serve as advocates for the individual student's admission to the professional program. The entire department of architecture faculty will serve as an admissions committee. Admission requires a majority vote of the faculty after review of the portfolio and statements of advocacy.

Upon admission to the professional program, all students, in consultation with an academic adviser, will submit a program of study for the fourth and fifth years of the curriculum. Students are encouraged, through this plan, to take maximum advantage of the opportunities that professional and free electives provide for pre-professional development, cultivation of specialization in and related to the profession, and/or preparation for graduate education. It is assumed that the students admitted to the professional program are continuing in the established studio curriculum sequence and are to complete the final two years of design studio at the UA School of Architecture. At the time of admission, however, the faculty may recommend or approve an alternative course of study that will allow students to pursue an area of concentration other than design in accordance with the letter and spirit of the curricula. Multi-disciplinary alternatives may be developed using electives and coursework from business, engineering and other areas applicable to the practice of architecture.

Students who fail to gain admission to the Bachelor of Architecture degree program will be referred to the School's academic advisers for appeal procedures, as well as for alternative opportunities and degree programs in the School and the University.

## ADMISSION TO THE PROFESSIONAL PROGRAM IN LANDSCAPE ARCHITECTURE

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Successful candidates are accepted in the professional program in landscape architecture in the fall of their second year. Applicants must have completed at least 30 hours of college-level work from an accredited institution that is acceptable toward degree credit (exclusive of remedial, orientation or repetitive course work). The 30 hours should include the following: 6 hours of English composition, 3 hours of mathematics, the first two theory courses, and the first two design studios, or consent. Preference is given to those who complete their design studios in Fayetteville.

Admission to the professional program is limited to 18 students each year. Grade-point averages are assessed from those courses that will count toward the degree and may include approved courses from other institutions. Applicants who have a grade-point average below 1.67 shall not be accepted in the professional core.

All students completing the first two design studios will be considered for admission into the professional program unless they notify the department to the contrary. Those students who take the first two design studios during the summer sessions may also be considered for acceptance into the professional program for the succeeding fall term. All candidates will be notified of their acceptance or rejection in writing, normally by the first of August. Those enrolled in the summer studios will be notified no later than one week prior to the start of fall classes. Students may elect to begin the year of pre-professional work on the Fayetteville campus of the University of Arkansas or at any accredited institution of higher education. Students who choose to complete this year of work at other institutions in the State of Arkansas should take the required English composition, math, social science, fine arts/humanities, botany/biology and geology courses.

Regardless of where the pre-professional work is done, 30 hours or more of course work must be completed to qualify for admission to the landscape architecture professional program of the School of Architecture. Only work acceptable toward degree credit in the departmental curriculum will be accepted as part of the 30 hours of required course work. Students who desire to attend other institutions still must take 12 credit hours of pre-professional landscape architecture and environmental design courses or an approved equivalent on the Fayetteville campus.

## AWARDS AND SCHOLARSHIPS

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Over 50 awards and scholarships, including both merit and need-based scholarships, are available to students in the School of Architecture. Most are awarded annually on the basis of recommendations made by the Honors and Awards Committee of the School of Architecture. Students must complete three semesters in residence with a minimum of 15 hours per semester to meet eligibility requirements for most scholarships. Only work accomplished since entering the School of Architecture will be considered in determining merit awards based on grade-point averages.

Applications for scholarships are made through the Advising Center. Students must apply by December 15.

## ORGANIZATIONS IN THE SCHOOL OF ARCHITECTURE

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### American Institute of Architecture Students

The American Institute of Architecture Students (AIAS) is a national organization whose purpose is "to organize architecture



students and combine their efforts to advance the science and art of architecture, to promote excellence in architectural education, training and practice, and to foster an appreciation of architecture and related disciplines among all persons.” AIAS stands with the American Institute of Architects (AIA), the American Collegiate Schools of Architecture (ACSA), the National Architectural Accrediting Board (NAAB), and the National Council of Architectural Registration Boards (NCARB) to make up the five collateral organizations within the profession.

The AIAS Chapter at the University of Arkansas functions as a student government, as well as a service and a social organization, organizing and participating in both on-campus activities, such as Architecture Week, and off-campus activities, such as Forum, the national architecture student convention held each year during the Thanksgiving season. The organization also promotes a good transition into professional life by interacting with AIA members. All students in the School’s architecture program are eligible for membership.

### **American Society of Landscape Architects, Student Chapter**

The purpose of the student chapter of the American Society of Landscape Architects is to bring together the landscape architecture students to combine their interests and efforts, to extend their knowledge of the profession of landscape architecture, and to help advance the profession while preparing for a professional career. Specifically, the chapter initiates student competitions, develops field trips, exchanges ideas between students and professionals, identifies and develops projects of community value, maintains correspondence with other student organizations, and solicits presentations of specialized subjects related to the profession of landscape architecture.

### **Tau Sigma Delta Honor Society**

The Alpha Eta Chapter of Tau Sigma Delta was established at the School of Architecture in 1977. The organization is the only national collegiate honor society recognized in the fields of architecture, landscape architecture, and allied arts. Its prime objectives are to emphasize scholarship and character, to stimulate mental achievement, and to recognize students who attain high scholastic standing. All students of the School are eligible for membership.

Elections to membership are made by the existing membership, subject to approval by the faculty, from fourth-year and fifth-year students maintaining a minimum 3.00 cumulative grade-point average. In addition, leadership, character, and promise of professional merit are considered in making selections.

### **Construction Specifications Institute**

Construction Specification Institute (CSI) is a non-profit technical organization dedicated to the improvement of specifications and building practices in the construction industry through service, education, and research. Founded in 1948, CSI provides a forum for architects, engineers, specification writers, contractors, construction product representatives, students, and others in the construction industry.

The Construction Specification Institute Student Affiliate Chapter was formed at the University of Arkansas in 1993. CSI provides social/networking opportunities for students with area professionals as well as sponsors lectures and seminars on current construction issues.

## **ACADEMIC REGULATIONS, SCHOOL OF ARCHITECTURE**

### **Plus/Minus Grading System**

The School of Architecture utilizes a plus/minus grading system that assigns numerical values to 12 different grades. These values are used for architecture or landscape architecture courses when grade-point averages are calculated. See page 42 for the method of calculating grade-point averages. The 12-step grading system with assigned values is as follows:

A .....	4.00	C .....	2.00
A- .....	3.67	C- .....	1.67
B+ .....	3.33	D+ .....	1.33
B .....	3.00	D .....	1.00
B- .....	2.67	D- .....	0.67
C+ .....	2.33	F .....	0.00

### **Academic Policies**

The following academic policies, beyond the requirements of the University, are applicable to all students in the School of Architecture. Please refer to the Landscape Architecture section for amendments to academic policies. These amendments supercede those of the school, specifically for items 1 and 4.

1. Any student receiving a grade of “D (+/-)” in two consecutive semesters of the Design Studio sequence must repeat both of the semesters in which the grades were received. A student receiving an “F” in design studio must repeat that studio before progressing. A student receiving a grade of “C” or better in a Design Studio may not retake that studio, except under special circumstances with approval of the Department Head.
2. Each student’s progress through the Design Studio sequence is monitored and governed by the faculty and subject to the Design Review process described below.
3. Admission to Architectural Design 4016 is contingent upon admission to the Professional Program in architecture as described above.
4. Prior to graduation, a student must present a 2.00 cumulative grade-point average at this institution in both all work attempted and all professional course work attempted.
5. Any student receiving an “I” in a design studio must complete all work necessary to receive a grade prior to the first day of the next studio in the student’s prescribed sequence to be eligible to enroll in that studio.
6. Any exceptions to the sets of degree requirements listed below must be approved in writing by the student’s department head and by the Advising Center.

### **Design Review Board**

Design Review is a process by which students may appeal grades in studio design courses or seek resolution of conflicts with studio faculty in which it is believed that there are questions of fairness or equity in the application of the published grading policy of the faculty member. Appeals seeking resolution of conflicts may be made at the end of the semester in which the conflict occurs. In the case of grade appeals, appeals may be made only after the student has received the official grade transcript from the registrar, and review will occur in a meeting of the design review committee in the first week of the subsequent semester. Appeals must be submitted in writing on the appropriate form, which is available in the advising center.

Design faculty may submit recommendations for non-continuance in the design sequence to the board, in situations in which there is both the probability of the student receiving a grade of D (+/-) or



F and a belief that non-continuance is in the best interest of the student and/or other students enrolled in the School of Architecture. The review board is empowered to withhold the consent for continuance, and the decision regarding a student's progression is binding, regardless of the student's grades.

The design review board for each department shall be appointed, at the beginning of each academic year, and chaired by the department head. The decisions of the board will be communicated in writing to the student by the department head.

### Off-Campus Study Requirement

Each student in the department of architecture is required to complete an approved off-campus study experience focusing upon complex urban relationships, and fostering cultural diversity. Approved programs in Architecture include a semester in Rome and a summer design studio in Mexico City.

Each student in the department of landscape architecture is required to participate in a summer study in Europe. This program exposes students to urban issues and planning approaches. The program takes place in the student's third year of design studios.

A special international programs fee supports the School of Architecture's international programs. These fees are assessed to all students participating in the architecture and landscape architecture design studio classes designated in the "Fees and Cost Estimates" section of this catalog, and Landscape Architecture 3914. The international program fees offset costs of maintaining off-campus programs that are not a part of the School's university-funded budget, as well as enhancing student-centered activities. The fees are non-refundable under any circumstances, including withdrawal from the respective programs. For further information, see notes on related program fees under "Fees and Cost Estimates" for the university.

### Cooperative Education Program

Cooperative education offers architecture and landscape architecture students an opportunity to participate in a paid work experience directly related to their academic studies in the School of Architecture. Students participating in the program must have completed all the requirements of the first three years of the program. Placement will be based on positions available and on academic qualifications, including a minimum 2.50 grade point. The period of cooperative work experience usually ranges from nine to 15 months.

Information about cooperative education may be obtained from the Advising Center.

### Portfolios

Students are required to maintain portfolios documenting all academic and design studio work. These portfolios are evaluated at the time the students apply to professional degree programs. They are also used to measure individual progress.

### Ownership of Work

All work submitted for credit, including design studio projects, becomes the property of the School of Architecture.

### School Computer Policy

All students enrolled in the School of Architecture are required to supply, by the beginning of the second semester of the second year, a personal computer matching or exceeding specifications issued by faculty. The specifications, which are updated annually, are available through the Advising Center. A substantial amount of software may be required depending on specific course requirements.

### Dean's List

In accordance with University policy, the School of Architecture publishes a Dean's List at the close of each semester.

### Graduation with Honors

Students who have demonstrated exceptional academic performance in baccalaureate degree programs will be recognized at graduation by the honors designation of *cum laude*, *magna cum laude*, or *summa cum laude*. To earn this distinction, the student must meet the following criteria:

1. At least the final two years of the degree course work must be completed at the UA Fayetteville campus.
2. For *cum laude*, the student must achieve a GPA of 3.50 or higher.
3. For *magna cum laude*, the student must achieve a GPA of 3.65 or higher.
4. For *summa cum laude*, the student must achieve a GPA of 3.80 or higher.

## Departments, Degree Programs and Courses

### ARCHITECTURE (ARCH)

Departmental Office  
120 Vol Walker Hall  
575-4945

- University Professors Emeriti Jones, Smart, Sutherland (C.)
- Professors Blackwell, Goodstein, Shannon, Vitale, Wall
- Professors Emeriti Buono, Fowler, Jacks, Kellogg, Williams
- Associate Professors Herman, Kucker
- Associate Professors Emeriti Dillinger, Denham, Doughty, Miller, Sutherland (M.), Tompkins
- Assistant Professors de Noble, Meehan, Rudzinski (R.), Sexton, Smith, Terry
- Clinical Assistant Professors Fitzpatrick, Kultermann
- Adjunct Assistant Professors Del Gesso, Pearson, Piga, Rudzinski (Y.)

### Bachelor of Architecture Degree

1. Completion of the following 95-hour professional program:

	HOURS
Architectural Design	58
ARCH 1015, ARCH 1025, ARCH 2016, ARCH 2026, ARCH 3016, ARCH 3026, ARCH 4016, ARCH 4026, ARCH 5016, ARCH 5026	
Architectural Technology	22
ARCH 2114, ARCH 2124, ARCH 3134, ARCH 3144, ARCH 4154, ARCH 5162	
History and Theory of Arch.	11
ARCH 1211, ARCH 1221, ARCH 2233, ARCH 2243, ARCH 4433	
Professional Practice	4
ARCH 5314	

2. Completion of the 35-hour general University Core as listed on page 44. In addition, specific requirements are listed below:

	HOURS
Mathematics	3
MATH 2043 or MATH 2053	
Laboratory Science	8

- PHYS 1044/1040L or PHYS 2013/2011L, required.  
 PHYS 1054/1050L or PHYS 2033/2031L, strongly recommended.  
 3. Completion of 27 hours of electives, as follows:

**Professional Electives**HOURS  
15

Chosen from upper-level courses (courses numbered 3000 or above) taught on the Fayetteville campus of the School of Architecture. Students participating in the Rome program may present only three hours of elective course work for professional elective credit. All other elective courses will be used to fulfill free elective requirements.

**Free Electives**

12

4. A minimum of 157 hours with a 2.00 cumulative grade-point average at this institution both in all work attempted and in all professional course work attempted is required. See Academic Policies.

5. Completion of the University Advanced Composition requirement either by course work or exemption by exam.

6. Participation for at least one semester in an approved international educational experience. (See Off-Campus Study Requirement, page 102.)

**NOTE:** The hours of any required course from which a student has been exempted will be added to the free elective requirement. No more than three hours of physical education and/or R.O.T.C. may be counted toward a degree. Courses not acceptable toward degree credit include those of a remedial or orientation nature and whose content is considered to be measurably duplicated elsewhere in the curriculum. ENGL 2003 is not counted toward degree credit, nor is ARCH 1003 for Architecture majors.

By following the preceding curriculum, students will meet the state-mandated University Core Requirements. They must also meet all other University requirements for graduation (page 41). We require that transfer students present a minimum of one semester of physics (with laboratories) and strongly recommend a second course in physics as fulfillment of the science requirement in the State Minimum Core. See University Core Requirements, page 41. Physics is preparatory to architectural technology courses; students presenting a different science option may have difficulty in the architectural technology courses.

Sample curriculum for the Bachelor of Architecture degree can be obtained from the architecture advising center.

**Professional Licensure Degree Requirement**

The National Architectural Accrediting Board (NAAB) only accredits professional programs offering the Bachelor of Architecture, which requires a minimum of five years of study, and the Master of Architecture degrees. These professional degrees are structured to educate those who aspire to registration and licensure to practice as architects. The curricular requirements for awarding these degrees must include three components — general studies, professional studies, and electives. Together these three components comprise a liberal education in architecture and ensure that graduates will be technically competent, critical thinkers who are capable of defining multiple career paths within a changing societal context.

While no four-year degrees are accredited by NAAB, the Bachelor of Science in Architectural Studies degree is useful to those who want a foundation in the field of architecture as preparation for either continued education in a professional degree program or for employment in fields related to architecture.

**Major Concentration in the History of Architecture and Urbanism**

The major concentration in the History of Architecture and Urbanism requires at least 33 semester hours, and must include the following:

1. Completion of requirements for admission to the professional program in architecture, including ARCH 2233, ARCH 2243 and ARCH 4433, and presentation of a 3.25 grade-point average.
2. At least nine hours of professional electives in a chosen area of specialization. Sample areas of specialization include the following:

**American Architecture and Urbanism**—select from  
 ARCH 4483, Arch. of the Americas  
 ARCH 5933, Preservation & Restoration  
 ARCH 4023, History of the City in American Art and Culture  
 ARCH 4023, American Building  
 ARCH 303, Morphology of Small Towns  
 ARCH 303, House Culture  
 LARC 3413, History of Landscape Arch.  
 LARC 4413, Contemporary Landscape Architecture, and other approved courses. Students declaring a specialization in American Architecture may develop an emphasis in Historic Preservation; ARCH 5933 is required for the emphasis.

**Early Modern (Renaissance and Baroque) Italy**—select from  
 ARCH 4023, Italian Arch. from the Renaissance to the Present  
 ARCH 5493, History of Urban Form  
 ARCH 4023, Birth of Modern Culture, (1600 - 1900)  
 ARCH 4023, St. Peter's Basilica  
 ARCH 302, Italian Art and Culture  
 ARCH 303, Arch. of the City, Rome  
 LARC 3413, History of Landscape Architecture and other approved courses.

**Modern Architecture and Urbanism**—select from  
 ARCH 4443, History of Architecture IV  
 ARCH 4483, Arch. of the Americas  
 ARCH 4913, Design Thinking: Relationships Between Theory and Process  
 ARCH 4023, History of the City in American Art and Culture  
 ARCH 303, House Culture  
 ARCH 4023, Italian Architecture from the Renaissance to the Present  
 ARCH 4023, Birth of Modern Culture, (1600 - 1900)  
 ARCH 303, Arch. of the City, Rome  
 LARC 4413, Contemporary Landscape Architecture, and other approved courses.

3. At least three hours in the History of Architecture and Urbanism Colloquium.
4. At least twelve hours of free electives to be selected from the following areas, to include:
  - a. At least three hours in upper-level (3000+) art history courses related to the area of specialization.
  - b. At least three hours in upper-level (3000+) humanities or social science courses related to the area of specialization; students pursuing the historic preservation emphasis must select ANTH 5023 or ANTH 5443.
  - c. Foreign Language requirements for specialization to be determined in consultation with advisor. Students who intend to pursue graduate study in architectural history should have competency in at least one foreign language; French and/or German are recommended.
5. At least six hours of research thesis (ARCH 5026, option studio); students pursuing the historic preservation emphasis are strongly encouraged to participate in the UACDC option studio (ARCH 4016 or ARCH 4026) and/or the UACDC summer program (ARCH 303).
6. Students considering pursuing the major concentration in History of Architecture and Urbanism are encouraged to fulfill the humanities and social science requirements of the 35-hour university

core with selections from the following courses.

ARHS 1003, Art Lecture  
 WLIT 1113, World Literature I  
 WLIT 1123, World Literature II  
 ENGL 2113, English Literature to 1798  
 ENGL 2123, English Literature from 1798 to Present  
 CLST 1003, Introduction to Classical Studies, Greece  
 CLST 1013, Introduction to Classical Studies, Rome  
 WCIV 1003, Western Civilization I  
 WCIV 1013, Western Civilization II  
 HIST 2003, History of the American People to 1877  
 HIST 2013, History of the American People 1877 to the Present  
 ANTH 1023, Introduction to Cultural Anthropology  
 Any foreign language, 2003 or 2013.

### Minor Concentration in the History of Architecture and Urbanism

The minor concentration in the History of Architecture and Urbanism requires at least 18 semester hours, and must include the following:

1. Completion of requirements for admission to the professional program in architecture, including ARCH 2233, ARCH 2243, and ARCH 4433.
2. At least nine hours of professional electives in any area of architectural and urban history. Declaration of an area of specialization is not required for the minor concentration.
3. At least three hours in the History of Architecture and Urbanism Colloquium.
4. At least six hours in humanities and/or social science courses related to the minor concentration.
5. The research thesis (ARCH 5026, option studio) is optional for students in the minor; students interested in an historic preservation emphasis are strongly encouraged to participate in the UACDC option studio (ARCH 4016 or ARCH 4026) and/or the UACDC summer program (ARCH 303).
6. Students considering pursuing the minor concentration in History of Architecture and Urbanism are encouraged to fulfill the humanities and social science requirements of the 35-hour university core with selections from the following courses.

ARHS 1003, Art Lecture  
 WLIT 1113, World Literature I  
 WLIT 1123, World Literature II  
 ENGL 2113, English Literature to 1798  
 ENGL 2123, English Literature from 1798 to Present  
 CLST 1003, Introduction to Classical Studies, Greece  
 CLST 1013, Introduction to Classical Studies, Rome  
 WCIV 1003, Western Civilization I  
 WCIV 1013, Western Civilization II  
 HIST 2003, History of the American People to 1877  
 HIST 2013, History of the American People 1877 to the Present  
 ANTH 1023, Introduction to Cultural Anthropology  
 Any foreign language, 2003 or 2013.

SEE PAGE 256 FOR ARCHITECTURE (ARCH) COURSES

### BACHELOR OF SCIENCE DEGREE IN ARCHITECTURAL STUDIES

The Bachelor of Science in Architectural Studies incorporates course work from the School of Architecture with liberal studies for students with interests that fall outside the parameters of the accredited professional degree program. The architectural studies program provides opportunities for students who wish to prepare for graduate study in an accredited architecture program or in an allied discipline,

such as architectural history, historic preservation, urban planning, or construction management, as well as serving students who seek opportunities in related fields that may not require the five-year accredited degree.

#### Requirements for a Bachelor of Science Degree in Architectural Studies follow:

1. Completion of the following 35-hour architectural studies program:

	HOURS
Architectural Design	16
ARCH 1015, ARCH 1025, ARCH 2016	
Architectural Technology	8
ARCH 2114, ARCH 2124, or LARC 2714, LARC 3723	
History and Theory of Arch.	11
ARCH 1211, ARCH 1221, ARCH 2233, ARCH 2243, ARCH 4433	

(Students interested in Landscape Architecture may substitute LARC 3413 for ARCH 2233 or ARCH 2243.)

2. Completion of the following 35-hour general education program:

	HOURS
English Composition:	6
ENGL 1013, ENGL 1023	
American History or Gov.	3
HIST 2003 or HIST 2013 or PLSC 2003	
Mathematics	3
MATH 2043 or MATH 2053	
Laboratory Science	8
PHYS 1044/1040L and PHYS 1054/1050L are recommended.	
Fine Arts/Humanities	6

One course must be elected from the fine arts core; one course from the humanities must be selected from PHIL 2003, PHIL 2103, PHIL 2203, or PHIL 3103. (See University Core Requirements)

Social Science 9

At least three hours should be taken in anthropology, economics, psychology, or sociology; and with not more than two courses taken from any one department to fulfill this requirement. (See University Core Requirements)

3. Completion of the following 21-hour basic program in the arts:

	HOURS
Communications	3
COMM 1313	
Humanities and Social Sciences	12
WCIV 1003 and WCIV 1013, or HIST 1113 and HIST 1123	
WLIT 1113 and 3 hours from WLIT 1123; a foreign language literature course; CLST 1003; or CLST 1013. (CLST 1003 or 1013 are recommended for architectural studies students.)	
Arts and Sciences	6

A minimum of six hours in courses numbered above 3000 (not including any courses cross-listed with architecture).

4. Completion of the following foreign language requirement.

	HOURS
Foreign Language (depending upon placement)	0-12

Students must demonstrate proficiency in a single modern or classic language other than English, usually by completing a sequence of four courses (1003, 1013, 2003, 2013). Students meeting the normal admission standard (two years of one foreign language in high school) may expect to satisfy this requirement with fewer courses, depending upon placement. In cases of unusually thorough preparation, or in the case of inter-



national students, exemption may be sought from the department of foreign languages.

5. Completion of 21 hours of electives:

HOURS

**Professional electives**

12

At least 6 hours in upper-level (3000 or above) courses taught in the School of Architecture. The remaining professional elective credits may be additional upper-level courses in the School of Architecture, approved courses in an allied discipline, or courses in another department of the university that contribute to the fulfillment of a recognized minor.

**Free electives**

9

6. A minimum of 124 hours with a 2.00 cumulative grade-point average at this institution both in all work attempted and in course work completed in the School of Architecture.

7. Presentation of at least 40 semester hours in courses numbered 3000 or above or courses in the School of Architecture numbered 2000 with specific course prerequisites.

8. Completion of the University Advanced Composition requirement, either by course work or exemption by exam.

9. Each student graduating in Architectural Studies must write a research/analytical paper in at least one upper-division course in her or his major or minor area.

10. Course work taken to remove course deficiencies assigned during admission or transfer will not be counted toward the degree. Similarly, courses considered to be remedial or developmental will not count toward the degree.

11. Transfer work in which grades of "D" or "F" were earned will not be allowed toward credit for graduation.

Architectural Studies degree candidates may pursue an academic minor. The minor must be in a field other than the major area, and students must notify the department of their intention to minor. An academic minor ordinarily consists of 15-18 hours. Specific requirements for the minor are given in the section entitled "Majors, Minors, and Courses of Instruction." Although students in architectural studies may choose from any recognized minor offered by the University, they are encouraged to consider the following fields:

African-American Studies	Environmental Studies
Anthropology	European Studies
Art	Gender Studies
Art History	Geography
Business Administration	History
Classical Studies	Latin-American Studies
Communication	Philosophy
Computer Sciences	Political Science
Drama	Psychology
Economics	Sociology
English	

Although foreign study is not required of candidates for the four-year degree, students in the architectural studies curriculum are encouraged to participate in the School of Architecture's off-campus study programs in Rome and Mexico City. Architectural studies majors also may take advantage of the community service opportunities offered through the University of Arkansas Community Design Center (UACDC).

To take maximum advantage of the opportunities the four-year degree offers for pre-professional development (cultivation of specialization in and related to the field, and/or preparation for graduate study) each candidate for the Architectural Studies degree will work with a faculty adviser to develop a program of study emphasizing a student's special interests.

Sample curriculum for the Bachelor of Science in Architectural Studies degree can be obtained from the Advising Center.

**LANDSCAPE ARCHITECTURE (LARC)**

Departmental Office

231 Memorial Hall

575-4907

- Professor Emeritis Burggraf
- Professor Crone
- Associate Professors Beatty, Brittenum, Rollet-Crocker
- Assistant Professor Boyer, Fields

**Bachelor of Landscape Architecture Degree**

1. Completion of the following 95-hour professional program:

	HOURS
Graphics and Design LARC 1315, LARC 1325*, LARC 2113, LARC 2336, LARC 2346, LARC 3356, LARC 3914, LARC 3366, LARC 4376, LARC 4383, LARC 5386	56
Landscape Architecture/Architecture History/Theory LARC 1211*, LARC 1221*, LARC 3413, LARC 4413, LARC 3921, LARC 3933, LARC 4123	15
Landscape Architecture Technical Courses LARC 2714, LARC 3723, LARC 3734, LARC 4714 HORT 3103	21
Professional Practice LARC 5613	3

2. Completion of the 35-hour University Core as listed on page 44. As part of the university core, the department recommends the following:

Laboratory Science BIOL 1543/1541L or BOTY 1613/1611L and GEOL 1113/1111L	8
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3. Completion of the following additional general education requirements:

Professional Electives	15
Free Electives	12

4. Candidates seeking graduation shall achieve a minimum of 157 hours and a minimum of a "C" in each course within the professional curriculum. The remaining balance of hours shall have a minimum of 2.00 cumulative grade-point average.

Any student receiving a "D+/-" or below in the professional core shall repeat the course. Any student with a second "D+/-" or below shall be considered for non-continuance in the program as determined by the department head and faculty. See "Academic Policies," page 101.

To become a candidate for entry into the landscape architecture professional program at the second-year level, a student must have completed 30 hours of pre-professional general education work, including those courses marked with an asterisk (\*) or their equivalent from an institution recognized by the University of Arkansas.

Entry into the professional program is limited and based upon grades in one's pre-professional work accepted toward degree credit, portfolio review, and professional performance. See "Admission to the Professional Program," page 100.

5. Students in landscape architecture are required to complete the department's study abroad program, preferably in one's third year.

**NOTE:** The hours of any required course from which a student has been exempted will be added to the elective requirement. No more than four hours of physical education and/or R.O.T.C. may be counted toward a degree. Courses not acceptable toward degree credit include those of a remedial or orientation nature and whose content is considered to be measurably duplicated elsewhere in the School's curriculum.

By following the preceding curriculum, students will meet the



state-mandated University Core Requirements. They must also meet all other University Requirements for graduation (page 44). We strongly recommend that transfer students present eight hours of laboratory science courses selected from botany, biology, geology and physical science as part of the State Minimum Core.

### **Professional Licensure Degree Requirement**

Forty-four states require licensure for landscape architects. The primary purpose of this licensure is to “protect the health, safety and welfare of the public.” Most states require that candidates possess an accredited degree in landscape architecture and complete a period of

professional experience, working with a licensed landscape architect. Once these requirements are complete, candidates must pass a national, uniform exam, sometimes with additional sections unique to that state. The five-year professional program gives its graduates this pre-requisite degree and prepares them for practice and the licensing exam.

Sample curriculum for the Bachelor of Landscape Architecture degree can be obtained from the School of Architecture Advising Center.

SEE PAGE 306 FOR LANDSCAPE ARCHITECTURE (LARC) COURSES

# J. William Fulbright

## College of Arts and Sciences

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### Dean of the College

526 Old Main  
575-4804

### Office of Student Affairs

525 Old Main  
575-4801

### Advising Center

Dave Dawson, Director  
101 Old Main  
575-3307

### Honors Studies

Sidney Burris, Director  
517 Old Main  
575-2509

### Interim Dean

Donald R. Bobbitt, Ph.D.  
Iowa State University

### Associate Deans

Charles H. Adams, Ph.D.  
University of Virginia

John G. Hehr, Ph.D.

Michigan State University

### Assistant Deans

Adam K. Motherwell, CPA, CFE  
University of Arkansas

Lisa Summerford, B.S.H.E.

University of Arkansas

### World Wide Web

<http://fulbright.uark.edu/>

**E-Mail:** [arscinfo@uark.edu](mailto:arscinfo@uark.edu)

### PURPOSE AND OBJECTIVES

No one in 20<sup>th</sup> century America has done more to advance the study of international relations or promote human understanding than J. William Fulbright. Committed to the idea that a free society and a peaceful world require, above all, an educated citizenry, he urged with unflagging energy the use of historical perspective, cultural relativity, and scientific objectivity in the study of human affairs. Senator Fulbright, like Thomas Jefferson, Andrew Jackson, and Abraham Lincoln before him, was committed to the belief that an educated, enlightened electorate will unerringly act not only in its own self-interest but also in the interest of all the people of the world.

In recognition of J. William Fulbright's contribution to the cause of liberal education and of his many services to his native state, the Board of Trustees of the University of Arkansas on November 20, 1981, resolved . . .

The College of Arts and Sciences at the University of Arkansas, Fayetteville, shall be named, henceforth, the J. WILLIAM FULBRIGHT COLLEGE OF ARTS AND SCIENCES. His name will imbue that college, and the University, with his reputation and image for a devoted interest in higher education and its accomplishments through its scholars as reflected in its students. That name will endow the college in such a way as to make it a world-wide center for liberal learning in the general and for the study of international relations in particular.

The college, dedicated to implementing the Fulbright philosophy that liberal education is a prerequisite for enlightened citizenship in a democratic society, has adopted as its mission the following statement from Fulbright's writings:

*... the highest function of higher education ... is the teaching of things in perspective, toward the purposes of enriching the life of the individual, cultivating the free and inquiring mind, and advancing the effort to bring reason, justice, and humanity into the relations of men and nations.*

Consisting of 19 departments and 22 special programs and research centers, Fulbright College has a twofold mission: to provide a broad, liberal education to all students within the University community and to furnish specialized knowledge at the upper division and graduate levels leading to a professional career. The general education curriculum within the college is designed to assure student's mastery of the English language, provide knowledge of the historical, social, intellectual, and linguistic bases of human culture, provide habits of thought and investi-

gation useful in later life, encourage exploration and development of aesthetic, political and ethical values, and offer the necessary foundation for professional competence or further training in professional or graduate schools. The general education curriculum of the college is based on the Platonic assumption that the pursuit of knowledge is an intrinsically good activity and that it is incumbent upon all members of an enlightened society to engage in that pursuit.

Recognizing that its students must become productive members of contemporary American society, Fulbright College offers undergraduate majors in 43 different fields ranging from chemistry and art, to journalism and German. In addition, the college, in cooperation with the Graduate School, offers course work leading to master's degrees in 31 fields and doctoral degrees in 13 fields. As a natural corollary of their instructional role, the faculty of the college pursue active research programs in their fields and programs that enable them simultaneously to provide state-of-the-art education to their students and bring national and international recognition to the University.

In sum, Fulbright College lies at the very heart of the University. The seat of liberal learning within the institution and the state, it is committed to providing excellent general education to all members of the student body and specialized instruction of the highest quality to its own majors.

## DEGREES OFFERED

The J. William Fulbright College of Arts and Sciences offers four-year curricula leading to the degrees of Bachelor of Arts (B.A.), Bachelor of Science (B.S.), Bachelor of Fine Arts (B.F.A.), and Bachelor of Music (B.M.). Each candidate for the B.A. and B.S. degrees selects a major field for specialized study. In addition to usual departmental majors there are interdepartmental majors and special programs for students preparing for professional degrees in law, medicine, dentistry, and teaching.

## COLLEGE ADMISSION REQUIREMENTS

Students seeking admission to the J. William Fulbright College of Arts and Sciences must meet the general requirements for admission to the University. In addition, students are expected to present two units (years) of a single modern foreign or classical language. Those unable to meet this standard will be expected to begin their collegiate foreign language study as soon as possible after matriculation. For these students, the first semester of language study will be considered to satisfy the admission deficiency and will not count toward the 124 hours required for graduation (although the course will appear as University credit, and the grade received will be computed in the grade-point average). For the students who meet the Fulbright Arts and Sciences admission requirements and continue with the same foreign language taken in high school, the first semester of language study will be considered remedial and will not count toward the 124 hours required for graduation (although the course will appear as University credit and the grade received will be computed in the grade-point average). Students transferring from other colleges at the University of Arkansas or from other institutions are expected to meet the same entrance standard.

## COLLEGE SCHOLARSHIPS

Foremost among scholarships available in the J. William Fulbright College of Arts and Sciences is the Sturgis Fellowship. This scholarship enables Fulbright College to offer to outstanding graduates of secondary and preparatory schools undergraduate fellowships valued at \$50,000 for four collegiate years.

Continuing students may also compete for the J. William Fulbright Prize for Distinction in the Liberal Arts. This scholarship carries a \$1000 award.

Students studying in the humanities or classics may qualify for the Elizabeth W. Fulbright Scholarship. This award is for students who are at least juniors and is intended to support a year of study abroad.

The Robbin C. Anderson Scholarship is available to students who place in the top 10% of their class and who transfer to Fulbright College from an Arkansas community or junior college.

Freshman students who show outstanding promise may receive awards from the James Victor Spencer, Jr. Memorial Scholarship, and students with similar promise or records are eligible for the Marion A. Steele Memorial Scholarship.

In addition, students may compete for general scholarship monies, which are awarded, regardless of classification, to students with the highest grade-point averages. Application for these monies is made through the Dean's Office, room 525 Old Main. Students may also obtain information and an on-line application on the Web through Fulbright College of Arts and Sciences Scholarships and Fellowships at <http://www.uark.edu/~arsc/students/scholarships.html>.

Numerous other scholarships are available from the departments of Fulbright College. Information may be sought from the departmental chairperson of the student's major and/or the Fulbright College's Scholarships and Fellowships website listed above.

## HONORARY & DEPARTMENTAL ORGANIZATIONS

There are many general-interest societies and organizations to which students may belong, and nearly every department of the University maintains an honor society through which high scholarship is rewarded. Students in Fulbright College may aspire to membership in the following organizations:

- Phi Beta Kappa (arts and sciences)
- Kappa Kappa Psi (band, men)
- Tau Beta Sigma (band, women)
- Phi Sigma (biology)
- Alpha Chi Sigma (chemistry)
- American Chemical Society (chemistry)
- Alpha Psi Omega (drama)
- Pi Kappa Delta (forensics)
- Gamma Theta Upsilon (geography)
- Sigma Gamma Epsilon (geology)
- Phi Alpha Theta (history)
- Alpha Kappa Delta (sociology)
- Pi Mu Epsilon (mathematics)
- Phi Mu Alpha (music, men)
- Sigma Alpha Iota (music, women)
- Sigma Pi Sigma (physics)
- Pi Sigma Alpha (political science)
- Alpha Epsilon Delta (pre-medical, medical technology, pre-dental)
- Psi Chi (psychology)
- Sigma Delta Pi (Spanish)
- Lambda Pi Eta (communication)
- Lambda Tau (writers)
- Kappa Tau Alpha (journalism)
- Pi Delta Phi (French)
- Delta Phi Alpha (German)
- Phi Beta Delta (international scholarship)
- Omicron Delta Epsilon (Economics)

## COLLEGE ACADEMIC REGULATIONS

### Academic Advising Services

The Fulbright College of Arts and Sciences provides an adviser for each student enrolled in the College. The faculty of each department within Fulbright College assumes responsibility for advising those students who have declared majors in the department and those who

have declared current interest in the department as a possible major area. Other advisory services exist to provide aid and direction to students who are non-degree candidates as well as those who are beginning work in the College without having yet decided on a major and those who are planning to attend professional schools such as those for medicine or pharmacy. Advisers in the Fulbright Advising Center will assist students in program planning and will help them to become aware of and familiar with the academic offerings of the University. Students should consult their advisers on a regular basis, not limited to registration matters but including all areas of their academic careers. Personnel in the Dean's office will direct students to the appropriate advising office.

Students should discuss with their advisers opportunities for individual variations as well as regular course requirements, etc. Programs and facilities of particular interest to individuals may include the Honors Program, programs for Advanced Placement and Credit by Examination, and the services of the Student Development Center.

The Career Development Center administers and interprets tests indicative of individual ability, interest, and achievement, and thus may aid also in counseling students about the field of study in which they are most likely to be effective and successful.

### Honors Studies and Graduation with Honors

To create an intellectual environment that challenges the best of students, the J. William Fulbright College of Arts and Sciences provides a comprehensive program of Honors Studies. This includes the Fulbright College Scholars Program, a four-year interdisciplinary honors program for students of superior academic ability or artistic talent, and the Departmental Honors Program, an honors program emphasizing directed independent study within a department or discipline of the College.

A student who has successfully completed a program of Honors Studies within Fulbright College is eligible to receive a baccalaureate degree with the distinction Fulbright College Scholar *Cum Laude*, or Departmental Scholar *Cum Laude* in the major field of study. Higher distinctions of *Magna Cum Laude* or *Summa Cum Laude* may be awarded to outstanding honors students by recommendation of the Fulbright College Honors Council.

To earn the distinction Fulbright College Scholar *Cum Laude* at graduation, a student must successfully complete the honors core curriculum, maintain a minimum grade-point average of 3.25, and satisfy requirements for departmental honors in the major field of study, including preparation and oral defense of an honors thesis. The Honors Council may award the higher distinctions of *Magna Cum Laude* or *Summa Cum Laude* based upon a student's total academic performance, including the academic transcript, the quality of the scholarly activity pursued within the major field of study, and the breadth of college study as a whole.

To earn the distinction of Departmental Scholar *Cum Laude* at graduation, a student must successfully complete requirements prescribed by the department of major, including an honors thesis and oral examination, maintain a minimum grade-point average of 3.25, and take 12 hours (which may include six hours of thesis) in Honors Studies. If a student demonstrates superior academic performance or an exceptionally high level of scholarly activity, the Honors Council may award the distinction of *Magna Cum Laude*.

In exceptional instances where truly outstanding work within the major field is coupled with the superior understanding of its relationship to the college work as a whole, the distinction *Summa Cum Laude* may be awarded.

A student who has earned at least 50 percent of his or her college credits at the University of Arkansas and has maintained a grade-point average of at least 3.80 through the semester preceding graduation shall earn the distinction of "Fulbright College Senior Scholar."

For more information about Honors Studies within Fulbright College, see page 109 and individual department listings.

## COLLEGE DEGREE REQUIREMENTS

Courses of study in Fulbright College of Arts and Sciences are designed to give students the comprehensive view of society that the modern world requires. Students who enroll in Fulbright College, or who elect some of its courses, have an opportunity to gain a broad cultural education, which is a part of intelligent living and, at the same time, to prepare for professions or to acquire technical training in the sciences. The college has two major teaching functions: to provide basic general education in the arts and in the sciences necessary to all persons for effective participation in the complex world in which we live, second, to furnish the student an opportunity to specialize in the field of the student's choice.

To implement the first of these aims and to furnish a broad base for the accomplishment of the second, the faculty of Fulbright College has adopted the requirements listed below for each degree.

Specific course requirements may be fulfilled in one of four ways:

1. Establishing credit in approved courses:
    - a. by enrolling in and completing the required work in the course,
    - b. by examination (credit will be entered as CR on a student's record as explained in Advanced-Standing Programs, page 19),
    - c. by advanced achievement, i.e., by satisfactory completion of a more advanced course of a sequence. For example, students who earn a grade of "C" or better in a third-semester foreign language course may be granted credit for the second semester course upon recommendation of the Foreign Language Department and approval by the Dean of the College. (This does not apply to work taken by correspondence or in transfer.)
  2. Gaining exemption by examination. Announced exemption examinations are routinely offered in several courses. Students may consult any department or the dean's office concerning exemption examinations.
  3. Advanced placement by examination.
 

A student who is granted advanced placement may elect to substitute a more advanced course for the listed required course.
  4. Transfer credit. Students presenting transfer credit in lieu of stated requirements may be asked to present official course descriptions, etc. Transfer work with grades of "D" or "F" will not be accepted.
- In addition to the University requirements listed above, each candidate for a degree in Fulbright College of Arts and Sciences must complete the degree program with a cumulative grade-point average of at least 2.00.

The Fulbright College residence requirement insists that no fewer than 30 hours of credit must be earned in courses offered by this college, and at least 24 of those hours must be numbered above 3000.

Each degree candidate in Fulbright College will receive an automated degree audit each semester of enrollment in advance of priority registration. It is e-mailed to the student, and a hard copy is sent to the student's adviser or major department. It is recommended that the student meet with his or her adviser to review the degree audit.

Each student graduating from Fulbright College must write a research/analytical paper for at least one upper-division course in his or her major. Satisfactory completion of an honors project or a senior thesis may fulfill this requirement. Students should consult with their major adviser for departmental procedures in satisfying this requirement.

A student may choose to write a senior thesis in a major area of study. The thesis may be accorded up to six hours of credit. Defense of the thesis before a committee is required. This thesis may be submitted to meet the college writing requirement mentioned above.

Questions concerning fulfilling the requirements should be referred to the student's adviser or to the dean's office, which will maintain



current lists of approved courses, experimental offerings approved to fulfill requirements for a specified period of time, examination schedules, and other options available to the student.

In addition to completing one of the sets of degree requirements listed below, a student must also complete the University Requirements for Graduation, including the University Core requirements (page 44).

### Bachelor of Arts

	HOURS
1. A total of 124 semester hours.	
2. University Core:	
ENGL 1013, ENGL 1023, Composition I, II	6
Advanced Composition Requirement (see page 43)	
HIST 2003, HIST 2013, or PLSC 2003	3
3. College Requirements	
Fine Arts. Six hours to include at least two different arts to be selected from the following nine courses:	6
ARTS 1003 or ARHS 1003 (except for art majors)	
DRAM 1003 (except for drama majors)	
COMM 1003	
MLIT 1003	
DANC 1003	
ARCH 1003 or LARC 1003	
HUMN 1003	
Foreign language (Depending upon placement)	0-12
Students must demonstrate proficiency in a single modern or classical language other than English, usually by completing a sequence of four courses (1003, 1013, 2003, 2013). The first semester of foreign language study (1003) is normally considered remedial and, thus, does not apply toward the 124 hours needed for graduation.	
Students meeting the normal admission standard (two years of one foreign language in high school) may expect to satisfy this requirement with fewer courses, depending upon placement. In cases of unusually thorough preparation, or in the case of international students, exemption may be sought from the Department of Foreign Languages.	
PHIL 2003 or PHIL 2103	3
MATH 1203 and one of the following three courses:	3-7
MATH 2043, MATH 2053, or MATH 2554	
Natural sciences with laboratory	12
At least 4 hours must be biological science, and at least 4 hours must be physical science. It is strongly recommended that students take an 8-hour sequence in one of the natural sciences, to be selected from the following:	
CHEM 1103/1101L, CHEM 1123/1121L,	
GEOL 1113/1111L, GEOL 1133/1131L, or	
PHYS 2013/2011L, PHYS 2033/2031L	
Four to eight hours in the biological sciences may be selected from the following courses:	
ANTH 1013/1011L	
BIOL 1543/1541L	
BOTY 1613/1611L	
MBIO 2013/2011L or	
ZOOL 1613/1611L	
Four to eight hours in the physical sciences may be selected from:	
ASTR 2003/2001L	
CHEM 1053/1051L	
CHEM 1103/1101L	
CHEM 1123/1121L	
GEOL 1113/1111L	
GEOL 1133/1131L	

PHYS 1023/1021L

PHYS 2013/2011L

PHYS 2033/2031L

PHYS 2054

PHYS 2074

Social science, to be selected from: 6

ANTH 1023

ECON 2013, ECON 2143

GEOG 2103, GEOG 2203

PLSC 2013

PSYC 2003

SOCI 2013, SOCI 2033, with at least 3 hours taken in anthropology, economics, psychology, or sociology, and with not more than one course taken from any one department

COMM 1313 3

WCIV 1003, WCIV 1013 or HIST 1113, HIST 1123 6

WLIT 1113 and 3 hours to be chosen from WLIT 1123, a foreign language literature course, any other world literature course, CLST 1003 or CLST 1013 6

4. Completion of the requirements for one of the majors described in the selection entitled Majors and Courses of Instruction. Majors may be chosen from the following fields:

American Studies

Anthropology

Art

Biology

Chemistry

Classical Studies

Communication

Computer Science

Criminal Justice

Drama

Economics

English

French

Geography

Geology

German

History

Intl. Relations

Journalism

Mathematics

Music

Philosophy

Physics

Political Science

Psychology

Social Work

Sociology

Spanish

Second or dual majors may be chosen from the following fields:

African-American Studies

European Studies

Latin American Studies

Middle East Studies

Russian Studies

See page 113 for the combined academic and medical degree.

See page 112 for minors.

5. Presentation of at least 40 semester hours in courses numbered 3000 and above or courses numbered 2000 with specific course prerequisites excluding MILS 2002, MILS 2012, AERO 2011, AERO 2021, and foreign language courses numbered 2003 and

2013. At least 24 of the 40 hours must be in courses numbered above 3000 and taken in Fulbright College. See also College Requirements on page 109.

6. Transfer work in which grades of "D" or "F" were earned will not be allowed toward credit for graduation.

7. If the student's degree program is strengthened by course work in the following departments, as many as eight hours may be applied toward the degree with the consent of the adviser:

AERO	HLSC	PHED
DEAC	ITED	RECR
EXED	MILS	UNIV
ETEC	PEAC	VOED

No more than four of the eight hours may be applied from AERO, MILS, PEAC, or DEAC, unless a student completes an ROTC program and receives a commission. Upon receipt of notification in the dean's Office of completion of ROTC program and receipt of commission, up to 16 hours of AERO or MILS may be applied toward the student's degree.

8. Each student graduating from Fulbright College must write a research/analytical paper for at least one upper-division course in his or her major. Satisfactory completion of an honors project or a senior thesis may fulfill this requirement. Students should consult with their major adviser for departmental procedures in satisfying this requirement.

9. Course work taken to remove course deficiencies assigned at the time of admission or transfer will not be counted toward the degree. Similarly, courses considered to be remedial or developmental will not count toward the degree.

10. Those courses constituting the State Minimum Core of 35 hours for the University of Arkansas are set forth on page 44 of this catalog. These courses, or courses transferred with a grade of "C" or better from any other state institution in Arkansas, may be used in partial or full satisfaction of the Fulbright College general education core.

### Bachelor of Science

	HOURS
1. A minimum of 124 semester hours. (Departments may require additional hours up to a total of 132.)	
2. University Core:	
ENGL 1013, ENGL 1023, Composition I, II	6
Advanced Composition Requirement (see page 43)	
HIST 2003, HIST 2013, OR PLSC 2003	3
3. College requirements:	
Foreign language (Depending upon placement)	0-9
Students must demonstrate proficiency in a single modern or classical language other than English, usually by completing a sequence of three courses (1003, 1013, 2003). The first semester of foreign language study (1003) is normally considered remedial and, thus, does not apply toward the 124 hours needed for graduation.	
Students meeting the normal admission standard (two years of one foreign language in high school) may expect to satisfy this requirement with fewer courses, depending upon placement. In cases of unusually thorough preparation, or in the case of international students, exemption may be sought from the Department of Foreign Languages.	
World literature, foreign literature, philosophy	9
(to be selected from PHIL 2003, PHIL 2103, PHIL 2203), fine arts (to be selected from at least two areas)	
WCIV 1003, WCIV 1013 or HIST 1113, HIST 1123	6
Social sciences (to be selected from the following:	3
ANTH 1023	

ECON 2013, ECON 2143  
GEOG 2103, GEOG 2203  
PSYC 2003  
SOC 2013

Science and mathematics 18  
(to be determined by the department of major and to be selected from at least two departments other than the department of the major).

4. Completion of the requirements for one of the majors described in the section entitled Degree Programs and Courses. Majors may be chosen in the following fields:

Biology  
Chemistry  
Computer Science  
Earth Science  
Geology  
Mathematics  
Physics  
Public Administration

See page 113 for the combined academic and medical degree.

See page 112 for minors.

5. Presentation of at least 40 semester hours in courses numbered 3000 and above or courses numbered 2000 with specific course prerequisites excluding MILS 2002, MILS 2012, AERO 2011, AERO 2021, and foreign language courses numbered 2003 and 2013. At least 24 of the 40 hours must be in courses numbered above 3000 and taken in Fulbright College. See also College Requirements on page 109.

6. See item #6, page 111.

7. See item #7, page 111.

8. See item #8, page 111.

9. See item #9, page 111.

10. See item #10, page 111.

### Bachelor of Fine Arts

	HOURS
1. A minimum of 128 semester hours.	
2. University Core:	
ENGL 1013, ENGL 1023, Composition I, II	6
Advanced Composition Requirement (See page 43)	
HIST 2003 or 2013 or PLSC 2003	3
3. College requirements:	
4 hours to be selected from	8
PHYS 1023/1021L	
CHEM 1053/1051L	
ASTR 2003/2001L	
GEOG 1113/1111L	
4 hours to be selected from	
ANTH 1013/1011L	
BIOL 1543/1541L	
BOTY 1613/1611L or	
ZOOL 1613/1611L	
Social sciences, to be selected from	3
ANTH 1023	
ECON 2013, ECON 2143	
GEOG 2103, GEOG 2203	
PHIL 2003, PHIL 2103	
PSYC 2003	
SOCI 2013, SOCI 2033	
with at least 3 hours in anthropology, economics, psychology, or sociology, and with not more than one course taken from any one department. PSYC 2003 is required for art education majors.	
Foreign language (Depending upon placement)	0-9

Students must demonstrate proficiency in a single modern or classical language other than English, usually by completing a sequence of two courses (1003, 1013, 2003). The first semester of foreign language study (1003) is normally considered remedial and, thus, does not apply toward the 124 hours needed for graduation. Students meeting the normal admission standard (two years of one foreign language in high school) may expect to satisfy this requirement with fewer courses, depending upon placement. In cases of unusually thorough preparation, or in the case of international students, exemption may be sought from the Department of Foreign Languages.

COMM 1313 or PHIL 2203 or an additional foreign language	3
COMM 1313 is required for art education majors.	
MATH 1203	3
WCIV 1003, WCIV 1013 or HIST 1113, HIST 1123	6
WLIT 1113, WLIT 1123	6
<b>Total Hours</b>	<b>44</b>

4. Presentation of at least 40 semester hours in courses numbered 3000 and above or courses numbered 2000 with specific course prerequisites excluding MILS 2002, 2012, AERO 2011, 2021, and foreign language courses numbered 2003 and 2013. At least 24 of the 40 hours must be in courses numbered above 3000 and taken in Fulbright College. See also College Requirements on page 109.
5. See item #6, page 111.
6. See item #7, page 111.
7. See item #8, page 111.
8. See item #9, page 111.
9. See item #10, page 111.

### Bachelor of Music

	HOURS
1. A minimum of 124 semester hours.	
2. University Core:	
ENGL 1013, ENGL 1023, Composition I, II	6
Advanced Composition Requirement (see page 43)	
HIST 2003, HIST 2013, or PLSC 2003	3
3. College requirements:	
Foreign language (Depending upon placement)	0 - 6
Students must demonstrate proficiency in a single modern or classical language other than English, usually by completing a sequence of two courses (1003, 1013). The first semester of foreign language study (1003) is normally considered remedial and, thus, does not apply toward the 124 hours needed for graduation. (For a major emphasis in voice, 9 hours additional is required in two different foreign languages appropriate to vocal repertoire. See Music Department requirements.)	
World literature, WLIT 1113	3
Fine arts, MLIT 1003	3
Natural sciences	8
(to be selected from the courses listed under the natural science requirements for the B.A. degree - 4 hours must be from biological science area, and 4 hours must be from physical science area).	
WCIV 1003, WCIV 1013 or HIST 1113, HIST 1123	6
MATH 1203	3
Social sciences to be selected from the following:	3
ECON 2013, ECON 2143	
GEOG 2103, GEOG 2203	
PHIL 2003, PHIL 2103, PHIL 2203	
PSYC 2003	

SOCI 2013, SOCI 2033  
ANTH 1023

4. Completion of the requirements for one of the majors described in the section entitled Majors and Courses of Instruction. Major fields of specialization may be chosen from the following: Applied music (performance areas are specified under Courses of Instruction), music theory, composition, Music Education.
5. Presentation of at least 40 semester hours in courses numbered 3000 and above or courses numbered 2000 with specific course prerequisites excluding MILS 2002, 2012, AERO 2011, 2021, and foreign language courses numbered 2003 and 2013. At least 24 of the 40 hours must be in courses numbered above 3000 and taken in Fulbright College. See also College Requirements on page 109.
6. See item #6, page 111.
7. See item #7, page 111.
8. See item #8, page 111.
9. See item #9, page 111.
10. See item #10, page 111.

### Minors

Academic minors in approved degree programs are options available to students in the Fulbright College of Arts and Sciences. The minor must be in a field other than the major and students must notify the department of their intention to minor. An academic minor ordinarily consists of 15-18 hours. Specific requirements for the minor are given in the section entitled Majors, Minors, and Courses of Instruction. Minors may be chosen from the following fields:

African-American Studies	History
Anthropology	Latin American Studies
Art	Legal Studies
Art History	Mathematics
Biology	Middle East Studies
Business	Music
Chemistry	Philosophy
Classical Studies	Physics
Communication	Political Science
Computer Science	Pre-Education
Drama	Psychology
Economics	Religious Studies
English	Social Work
European Studies	Sociology
French	Spanish
Gender Studies	Statistics
Geography	
Geology	
German	

Fulbright College also recognizes all official minors offered by sister colleges at the University of Arkansas. Students wishing to have such minors made a part of their transcript must notify the Fulbright College dean's office (MAIN 525) when degree application is made.

### Teacher Education Programs

Acceptance in a teacher education program is governed by regulations approved by the University Teacher Education Board for Initial Licensure and administered by the College of Education and Health Professions and the Fulbright College of Arts and Sciences. For students intending to obtain teacher licensure, except in Music and Art, Fulbright College offers a minor in pre-education (ASED), which when taken in conjunction with a standard major will qualify students for admission to the Master of Arts in Teaching (M.A.T.) degree and licensure program. See the ASED section on page 119 and the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education

and Health Professions section on page 170 for details concerning these regulations. Students should declare their intentions to prepare for teaching no later than the first semester of the sophomore year. For more information, please contact the Coordinator of Teacher Education in the College of Education and Health Professions, Peabody Hall, Room 8 and the Fulbright Advising Center in room 101 of Old Main.

### Combined Academic and Medical or Dental Degree

Fulbright College offers both the Bachelor of Arts and Bachelor of Science degrees in medical science or medical science (dentistry). A student may substitute the first year of regular medical or dental work taken in any standard, approved medical or dental school for 30 hours of the total required for the Bachelor of Arts degree or for 33 hours of the total required for the Bachelor of Science degree provided that the following requirements are met:

1. Completion of all core requirements for a B.A. or B.S. degree, as appropriate, prior to student's entrance in medical or dental school.
2. Completion of a minimum of 12 hours of courses numbered above 3000 taken in Fulbright College.
3. Completion of at least 30 hours immediately prior to student's entrance in medical or dental school in residence in Fulbright College.

Students interested in this degree should consult with their adviser or with the Fulbright College dean's Office early in their program. Formal application for the degree should be made to the Registrar.

This program is for highly qualified students with outstanding academic records who may be eligible for early admission to medical school or dental school programs. The year of a medical or dental study substitutes for the major in the B.A. or the B.S. degree program.

### Cooperative Education

The Cooperative Education project is designed to offer students an opportunity to participate in a paid work experience directly related to their academic major. It resembles an internship, but contemplates a series of at least two such work experiences. The program also insists that at least minimal academic credit be awarded, thus ensuring that the work experience will be directly related to the student's academic program. Cooperative Education offers advantages to students needing assistance in financing their education, and it offers the College a tangible way to demonstrate our conviction that although we do not stress vocational or professional training per se, there is nothing inimical between a liberal arts education and the world of work. Prerequisites include 45 credit hours, a cumulative GPA of 2.50, and consent of academic coordinator. A maximum of 4 credit hours of ARSC 310 (Cooperative Education) may be applied toward the student's degree.

Detailed information about Cooperative Education may be obtained from the Office of the Dean, Fulbright College, or from the Career Development Center, 607 Arkansas Union.

### UNDERGRADUATE PREPARATION FOR PROFESSIONAL PROGRAMS

The Fulbright College of Arts and Sciences offers courses that are required for the study of law, medicine, dentistry, teaching, nursing, pharmacy, social work, and other professions. It provides supporting programs in the humanities, fine arts, the social sciences, and the natural sciences for students who are enrolled for professional programs in other undergraduate colleges on the campus, and for those students who may plan to enter postgraduate professional programs in other colleges.

In some instances it may be possible for the student to plan the use of undergraduate electives so that the time required for completion of a postgraduate professional program may be shortened by as much as one full year. The program for which this may be done is the Master of

Social Work. For information and advice concerning this program see the Chairman of Studies in Social Work, or contact the Director of the Graduate School of Social Work, University of Arkansas at Little Rock, 33rd and University, Little Rock, Arkansas 72204.

In other pre-professional programs, the distribution of credits applied toward a degree in Fulbright College may require the consignment of a considerable portion of the available electives to prerequisite courses, and to courses that are in direct support of the undergraduate major area.

Interested students should contact the appropriate advisers early in the planning of such programs.

### Pre-Law Program

While there is no prescribed pre-law curriculum, Fulbright College offers a minor in legal studies administered through the department of political science. Students considering a career in law may consult the UA School of Law Catalog or the Fulbright College Advising Center for information concerning certain categories of courses that may be helpful to the study and practice of law. Students uncertain about a major degree program should contact the Fulbright Advising Center.

A baccalaureate degree is required for admission to the UA School of Law, except for those students in the Fulbright College of Arts and Sciences who are admitted to the special six-year program referred to in the paragraph immediately following. All applicants for admission are required to take the Law School Admission Test. (See page 213.)

The University of Arkansas School of Law at Fayetteville and the Fulbright College of Arts and Sciences jointly administer a six-year program whereby highly qualified students may earn both the bachelor's degree and the Juris Doctor degree. Any student enrolled in the J. William Fulbright College of Arts and Sciences during a spring semester shall be permitted to matriculate in the School of Law in the following fall semester if the admission complies with Section 1 of Part A of the law school's admission policies and if the student meets the following conditions:

1. At least 30 consecutive hours of course work in Fulbright College,
2. At least 94 hours credited toward a bachelor's degree by Fulbright College,
3. Completion of Fulbright College's requirements for a major in connection with the bachelor's degree,
4. A cumulative grade-point average in all college or university course work of at least 3.50, without grade renewal,
5. An LSAT score of at least 159.

A student may substitute law school course work for the remaining total hours required for the bachelor's degree from Fulbright College. Formal application for the degree should be made to the Registrar. Information about the program may be obtained in the dean's office or the Fulbright Advising Center.

### HEALTH RELATED PROFESSIONS

#### Pre-Professional Programs: Chiropractic, Dental, Medical, Optometry, Pharmacy, Podiatry

#### Allied Health Pre-Professional Programs: Cytotechnology, Dental Hygiene, Diagnostic Medical Sonography, Medical Technology, Nuclear Medicine Technology, Occupational Therapy, Ophthalmic Medical Technology, Physical Therapy, Radiologic Technology, Respiratory Care

For additional information about these and other allied health professions, contact the Fulbright College Advising Center, 101 Old Main (479) 575-3307, E-mail: [fcac@cavern.uark.edu](mailto:fcac@cavern.uark.edu), Web site: <http://www.uark.edu/~fcac/>.

**General:** Each of the above areas involves the completion of a



minimum number of semester hours and certain required courses. Many of the specific course requirements are common to all programs, and it is in the student's best interest to complete these requirements as early as possible. Careful scheduling is essential to ensure that courses are taken in proper sequence.

**Pre-Chiropractic Program:** Students entering the pre-chiropractic program should determine the specific admission requirements for the school(s) of their choice at an early date. Most chiropractic colleges require a minimum of 90 hours of college credit to include the following: 6 hours of English, 12 hours chemistry (with a minimum of 3 hours inorganic chemistry and at least 6 hours organic chemistry and/or biochemistry), 8 hours of biology or zoology, 3 hours of psychology, 15 hours of social science or humanities, and 8 hours of physics.

All students planning careers in chiropractic should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Dental Program:** All dental schools require a minimum of three years of college work and most schools give preference to applicants who have completed a baccalaureate degree. The minimum requirements for admission to most dental schools can be met at the University of Arkansas by completing the following courses:

ENGL 1013, ENGL 1023, BIOL 1543/1541L  
plus 4 additional hours of biology, PHYS 2013/2011L,  
PHYS 2033/2031L,  
and CHEM 1103/1101L, CHEM 1123/1121L, CHEM 3603/3601L,  
CHEM 3613/3611L.

Mathematics is not a general requirement, but students are expected to have a background equivalent to college algebra and trigonometry.

Students who complete a minimum of 90 hours of work may qualify for the combined degree program provided that they complete the requirements for graduation in Fulbright College of Arts and Sciences.

All dental schools require the Dental Admissions Test. It is suggested that applicants take the DAT one year prior to the time they plan to enter dental school. A student planning a career in dentistry should contact Dr. J.C. Rose, Department of Anthropology (575-2508).

**Pre-Medical Program:** Medical schools in general require a minimum of 90 semester hours of college credit exclusive of military science and physical education, and most recommend that the student complete a baccalaureate degree. All medical schools have specific course requirements, and the student should determine those requirements for the school or schools of his or her choice. The minimum requirements for most medical schools can be met by completion of the following courses: ENGL 1013, ENGL 1023, ENGL 2003 or substitute, BIOL 1543/1541L, plus one other course in biological sciences, or equivalent, CHEM 1103/1101L, CHEM 1123/1121L, CHEM 3603/3601L, CHEM 3613/3611L, PHYS 2013/2011L, PHYS 2033/2031L. Additional courses are recommended. Special opportunities and experiences are available to pre-medical students through the Liebolt Endowment.

Pre-medical students are encouraged to complete the requirements for the B.A. or B.S. degree. As part of these requirements the student must choose a major, but the choice of a major has no direct bearing upon admission to medical school and should reflect the particular interests of the student. If a student is admitted to a medical school prior to completion of the baccalaureate degree requirements, he/she may wish to take advantage of the combined degree program in medical science. If that program is elected, the student should complete all of the basic university and college requirements for graduation during residence on the UA campus.

Most medical schools require the Medical College Admissions Test, which is given in the spring and fall at the University. The MCAT normally should be taken in the spring preceding application to medical school. Admission to medical school is highly competitive, and a good grade-point average is demanded. A grade-point average of 3.30 is the minimum likely to receive favorable consideration. A grade of "D" in

any course required by the medical school is not considered satisfactory. Advising is available through Dr. Neil Allison (575-5179) and Dr. Jeanne McLachlin (575-5348). Dr. Allison serves as chair of the pre-medical committee. University of Arkansas Pre-Medical Web site: <http://www.uark.edu/premed>.

**Pre-Optometry Program:** Admission requirements to schools and colleges of optometry are not uniform. Typically they include courses in English, mathematics, physics, chemistry, and biology or zoology. Some colleges and schools have specific requirements in psychology, social sciences, literature, philosophy, and foreign languages. Students in this program should determine the specific requirements of the school or college they wish to attend at an early date and plan their program of study accordingly. Details concerning the program are available from Dr. Tim Kral, Department of Biological Sciences (575-3251).

**Pre-Pharmacy Program:** Entrance requirements for pharmacy schools vary, therefore students should research the schools of their choice to determine specific prerequisite course work.

The University of Arkansas for Medical Sciences College of Pharmacy requires 65 hours of pre-professional courses to include: 4 hours of calculus, 9 hours of English/Communication, 16 hours of chemistry, 8 hours of biology, 4 hours of physics, 3 hours of economics, 6 hours of critical thinking/problem solving, and humanities to total 65 hours.

Students are advised to begin taking humanities electives during the second semester of their freshman year. Since pharmacy schools have many more applicants than they can accept, the student is urged to earn a grade-point average somewhat higher than the minimum of 2.00.

Grades are a major consideration when admission committees evaluate a student's qualifications for acceptance. The University of Arkansas College of Pharmacy and other pharmacy schools also require applicants to take the Pharmacy College Admission Test (PCAT). This may be taken in November or February. See the adviser for details.

The pre-pharmacy adviser for the University of Arkansas is Lorraine Brewer, Department of Chemistry and Biochemistry (575-3103).

**Pre-Podiatry Program:** To meet entrance requirements for colleges of podiatry, an applicant must have completed a minimum of three years at an accredited undergraduate institution, however, most entering students have completed a baccalaureate degree. Courses required for admission vary with the college, and a student should inquire early in the academic program about the courses required for a particular institution. In general, a student is advised to include at least 8 hours of general chemistry, 8 hours of organic chemistry, 8 hours of physics, 8 hours of biology, and 6 hours of English. Additional information concerning requirements for specific colleges of podiatry may be obtained from Dr. Neil Allison, Department of Chemistry and Biochemistry (575-5179).

**Pre-Cytotechnology Program:** Requirements for the University of Arkansas for Medical Sciences College of Health Related Professions program in cytotechnology include 20 hours of biology, 8 hours of chemistry, 3 hours of college algebra, 6 hours English composition, 6 hours of Western civilization, 3 hours in American history or national government, 3 hours in the humanities, 6 hours in the social sciences, 3 hours of communication, 3 hours fine arts, and 24 hours of electives for a total of 84 hours. At least 5 of these elective hours must be upper-level.

All students planning careers in cytotechnology should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Dental Hygiene Program:** Students entering the pre-dental hygiene program should determine the specific requirements for admission to the schools of their choice at an early date. Entrance requirements for the dental hygiene program at the University of Arkansas for Medical Sciences College of Health Related Professions consist of a minimum of 37 hours of college credit to include the following courses: 4 hours of biological science, 4 hours of microbiology, 4 to 5 hours of chemistry, 3 hours of mathematics, 6 hours of English, 3 hours of speech, 3 hours of sociology, 3 hours of psychology, 3 hours of computer science, and 3 hours of U.S. history or U. S. government. Students

wishing to earn the B.S. degree in dental hygiene through the College of Health Related Professions must include: 6 hours of Western civilization, 3 hours of fine arts, 3 hours of humanities, and 12 hours of upper-level electives.

All students planning careers in dental hygiene should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Diagnostic Medical Sonography Program:** Students entering this program should determine the specific admission requirements for the school of their choice at an early date. The admission requirements for the diagnostic medical sonography program at the University of Arkansas for Medical Sciences College of Health Related Professions consist of a minimum of 63 semester hours to include: 6 hours of English, 4 hours of human anatomy, 4 hours of human physiology, 4 hours of introductory physics, 3 hours of communication (speech), 3 hours of college algebra, 3 hours of U.S. history, 6 hours of history of civilization, 3 hours of sociology, 3 hours of psychology, 3 hours of fine arts, 3 hours of humanities, 3 hours of computer fundamentals/applications and 15 hours of electives.

All students planning careers in diagnostic medical sonography should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Medical Technology Program:** Students entering this program should determine the specific admission requirements for the school of their choice at an early date. Typically, 68 hours of college credit are required for degree programs. The admission requirements for Medical Technology at the University of Arkansas for Medical Sciences College of Health Related Professions are as follows:

Applicants for admission must present a minimum of 68 semester hours to include 6 hours of English, 8 hours of general chemistry, 16 hours of biology (4 hours of introductory biology, 4 hours of microbiology, 4 hours of human physiology, and 4 hours of biology electives), 3 hours of communication (speech), 3 hours of fine arts, 6 hours of Western civilization, 3 hours of college algebra, 3 hours of U.S. history, 6 hours of other social sciences (two different fields), 3 hours of humanities, and 12 hours of electives.

All students planning careers in medical technology should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Nuclear Medicine Technology Program:** Students who wish to attend a program in nuclear medicine technology should determine the specific requirements for admission to the schools of their choice. Admission requirements for the University of Arkansas for Medical Sciences, College of Health Related Professions, include completion of the courses listed below or their equivalents plus enough electives to bring the total to 85 hours. Admission is granted on a competitive basis, so students are urged to earn a grade-point somewhat higher than the 2.00 minimum. Upon completion of the program at UAMS, students will earn a bachelor's degree in nuclear medicine technology.

Course requirements for admission are as follows: 4 hours of anatomy, 4 hours of physiology, 8 hours of general chemistry, 4 hours of general physics, 3 hours of college algebra or higher-level mathematics, 6 hours of English, 3 hours of speech communication, 3 hours of fine arts appreciation, 6 hours of Western civilization, 3 hours of U.S. history, 6 hours of social sciences, 3 hours of humanities, and at least 8 hours of upper-level credits. It is recommended that elective courses be in math and science, technical writing, computers, and health sciences.

All students planning careers in nuclear medicine technology should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Occupational Therapy Program:** Students entering the pre-occupational therapy program should determine the specific requirements for admission to the schools of their choice at an early date. The admission requirements for occupational therapy at the University of Central Arkansas consist of a minimum of 72 hours of college credit to include the following courses: 6 hours of English, 3 hours of world literature, 3 hours of fine arts, 3 hours of health education, 3 hours of US

history or government, 3 hours of humanities, 3 hours of mathematics, 2 hours of medical terminology, 6 hours of Western civilization, 3 hours of communication (speech), 15 hours of biology (must include a course in both anatomy and physiology), 5 hours of chemistry, 4 hours of physics, 6 hours of psychology (including 3 hours of statistics), 3 hours of sociology, and an additional 6 hours of either sociology or psychology electives.

All students planning careers in occupational therapy should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Ophthalmic Medical Technology Program:** Admission requirements for ophthalmic medical technology at the University of Arkansas for Medical Sciences College of Health Related Professions consist of a minimum of 55 credit hours to include: 4 hours of anatomy, 4 hours of physiology, 4 hours of microbiology, 9 hours of biology electives, 4 hours of physics, and 3 hours of college algebra (or higher level mathematics). General Education courses: 6 hours of English composition, 6 hours of history of civilization/world history, 3 hours of American history or National Government, 6 hours of social science, 3 hours of speech communication, 3 hours of fine arts, and 3 hours of humanities.

All students planning careers in ophthalmic medical technology should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Physical Therapy Program:** Students planning to attend physical therapy school should determine the specific admission requirements for schools of their choice at an early date.

Admission requirements for the Doctor of Physical Therapy program at the University of Central Arkansas requires completion of a baccalaureate degree to include the following: 4 hours of general biology, 4 hours of human anatomy, 4 hours of human physiology, 4 hours of microbiology, 3 hours of introductory neuroscience (physiological psychology at the University of Arkansas), 4 hours of histology, 8 hours of chemistry, 8 hours of physics, 3 hours of computer literacy, 3 hours general psychology, 3 hours psychology elective, 3 hours of statistics, 2 hours of medical terminology, and 3 hours of technical writing.

Any student planning a career in physical therapy should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Radiologic Technology:** Students interested in radiologic technology should determine the specific admission requirements for the school of their choice at an early date. The admission requirements for the radiologic technology program at the University of Arkansas for Medical Sciences College of Health Related Professions consist of a minimum of 32 semester hours to include the following: 6 hours of English, 4 hours of human anatomy, 4 hours of human physiology, 3 hours of communication (speech), 3 hours of college algebra, 3 hours of U.S. history, 3 hours of sociology, 3 hours of psychology, and 3 hours of computer fundamentals/applications.

All students planning careers in radiologic technology should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

**Pre-Respiratory Care Program:** Students who wish to enter the B.S. Degree program in Cardio-Respiratory Care in the College of Health Related Professions at the University of Arkansas for Medical Sciences must satisfactorily complete the courses listed below. The applicant must also complete the Health Occupation Aptitude Exam (administered by the department) as part of the application procedure. The B.S. program is available in Texarkana and in Little Rock.

Pre-requisite requirements consist of a minimum of 66 hours, including the following: 4 hours anatomy, 4 hours physiology, 4 hours microbiology, 8 hours chemistry, 4 hours physics, 3 hours computer fundamentals, 3 hours college algebra, 3 hours speech, 6 hours English composition, 3 hours American history or U.S. government, 6 hours history of Western civilization or world history, 3 hours fine arts, 3 hours humanities, 3 hours sociology, 3 hours psychology and 11 hours electives.

All students planning careers in Respiratory Care should contact the Fulbright College Advising Center, 101 Old Main (575-3307).

## GRADUATE STUDIES

The Graduate School, in cooperation with the faculty of Fulbright College of Arts and Sciences, offers work leading to the graduate certificate or to the degrees of Master of Arts, Master of Science, Master of Music, Master of Fine Arts, Master of Public Administration, and Doctor of Philosophy.

Students interested in any of these advanced degrees should consult the *Graduate School Catalog* or the Dean of the Graduate School.

## Departments, Degree Programs and Courses

### AFRICAN-AMERICAN STUDIES (AAST)

Nudie E. Williams  
Chair of Studies  
416 Old Main  
575-3001

- Professor Morgan, Sociology
- Associate Professors Jones, Music, Williams, History
- Assistant Professors D'Alisera, Anthropology, Robinson, History

Students who wish to gain knowledge and understanding of the history, social organization, current status, and problems of African-Americans and of their contributions to the American heritage may elect a combined major in African-American studies together with a major in anthropology, economics, history, philosophy, political science, psychology, sociology, or social welfare.

#### Requirements for a Combined Major in African-American Studies:

1. Eighteen hours in African-American Studies courses in addition to the requirements for the departmental major.
2. African-American Studies required courses: AAST 499V, African-American Studies Seminar, SOCI 3033, American Minorities, SOCI 4123, Black Ghetto, and HIST 3233, African-American History.
3. The remaining six hours will be selected from the following recommended courses: ANTH 3253, Cultures of the South, HIST 4563, The Old South, 1607-1865, HIST 4573, The New South, 1860 to Present, HIST 4383, The History of Sub-Saharan Africa, SOCI 4073, Peoples of East Africa, WLIT 4993, African Literature, and ENGL 4333, African-American Literature.
4. No course can be counted both for African-American Studies and the departmental major.

**Requirements for a Minor in African-American Studies:** AAST 499V and HIST 3233, and at least 9 hours of approved elective courses. Interested students should consult with the African-American Studies Chairman for selection of appropriate classes.

With careful advising, a combined major of African-American Studies and majors other than those listed may be developed to meet student needs. Members of the African-American Studies Committee and interdepartmental committee are Nudie E. Williams, chairman, history, Gordon Morgan, sociology, D'Alisera, anthropology, Charles Robinson, history, and Eddie W. Jones, music.

Students desiring further information may consult with Professor Williams of the history department.

SEE PAGE 248 FOR AFRICAN AMERICAN STUDIES (AAST) COURSES

### AMERICAN STUDIES (AMST)

Robert B. Cochran  
Chair of Studies  
506 Old Main  
575-7708

The J. William Fulbright College of Arts and Sciences has a long-established commitment to the study of American cultures. Virtually every department offers courses centered on various aspects of human experience on the North American continent. The American Studies major promotes interdisciplinary approaches to these fields and provides substantial flexibility for students wishing to design tightly focused or highly individualized courses of study.

**Requirements for a Major in American Studies** – The American Studies major program requires 30 semester hours, which must include the following:

1. Three hours Introduction to American Studies AMST 2003
2. Three hours of American history HIST 2003 or HIST 2013. (Students must also complete PLSC 2003 to satisfy the University requirement.)
3. Three hours of American literature, ENGL 3303 (Papers submitted in this course will fulfill the Fulbright College writing requirement.)
4. Eighteen hours to be selected from the following courses, with the selection to include:
  - a. At least one of the following:  
ARCH 4483, ARHS 4913, ARHS 4923, ENGL 3343, ENGL 3363, COMM 4143, COMM 4353, COMM 4383, COMM 4883, MUHS 4253
  - b. A least one of the following:  
ANTH 3213, ANTH 3233, ANTH 3253, GEOG 3343, GEOG 4063, SOCI 3033, SOCI 3193, SOCI 3253
  - c. At least one of the following:  
PLSC 3153, PLSC 3853, PLSC 3933, PLSC 4203
  - d. Nine hours in the chosen area of concentration. Sample areas of concentration include the following:

**African-American Culture** – selections from ENGL 4333, HIST 3233, PLSC 4243, PLSC4263, SOCI 3033, SOCI 4123, and other approved courses

**Contemporary Politics** – selections from COMM 4383, HIST 4733, PLSC 3973, SOCI 3153, SOCI 4053, and other approved courses.

**Gender Issues** – selections from ENGL 3923H, ENGL 4223H, SOCI 4203, and other approved courses

**Native American Culture** – selections from ANTH 3203, ANTH 3213, ANTH 3263, ENGL 4223H, HIST 3263, and other approved courses

**Southern Culture** – selections from ENGL 3923H, GEOG 4093, HIST 4563, HIST 4573, and other approved courses

**Western or Frontier Studies** – selections from HIST 3383, HIST 4463, PLSC 3223, and other approved courses

**Requirements for the Major in American Studies with Emphasis on Regional Studies:** Students wishing to major in American Studies with emphasis on regional studies may complete requirements (1), (2), (3), and (4) as all majors. They must also complete ANTH or SOCI 3253 to satisfy requirement (4A), GEOG 4093 to satisfy requirement (4B), and PLSC 3223 to satisfy requirement (4C). Either ENGL 4343 or ENGL 4383, and either HIST 4563, or HIST 4573, must also be com-



pleted in satisfying requirement (4D). These requirements total fifteen hours, leaving three elective hours to complete requirement (4D).

**Requirements for the Certificate in American Studies for International Students Not Seeking a University of Arkansas Degree:** International students not seeking a University of Arkansas degree may receive a certificate in American Studies by completing requirements (2) and (3), plus completing a total of twelve hours in any combination from the courses listed under requirement (4). This represents a total of 18 hours.

**Requirements for Departmental Honors in American Studies:** The Departmental Honors Program in American Studies offers junior and senior students the opportunity to enroll in enriched courses and to conduct independent research. In addition to satisfying all other requirements for the major, honors candidates must complete at least 12 hours of honors work, including six in honors essay. The Honors Program in American Studies requires a total of 33 hours in addition to University and College requirements.

SEE PAGE 252 FOR AMERICAN STUDIES (AMST) COURSES

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## ANTHROPOLOGY (ANTH)

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M. J. Schneider

Chair of the Department  
330 Old Main  
575-2508

Web Site: [www.uark.edu/depts/anthinfo/](http://www.uark.edu/depts/anthinfo/)

- University Professor Limp
- Professors Mainfort, Rose, Sabo, Schneider (M.J.)
- Associate Professors Kay, Kvamme, Swedenburg, Ungar
- Assistant Professors D'Alisera, Erickson, Striffler, Plavcan

Courses in anthropology provide an introduction to world peoples, their ways of living, and world views. Anthropology helps students to better understand human similarities and differences.

**Requirements for a Major in Anthropology:** 30 semester hours including ANTH 1013, ANTH 1011L, ANTH 1023, ANTH 3023/3021L, and ANTH 4013.

**Writing Requirement:** The Fulbright College research/analytical paper requirement for anthropology majors is fulfilled in ANTH 4013.

**Requirements for Departmental Honors in Anthropology:** The Departmental Honors Program in Anthropology provides an opportunity for outstanding undergraduate majors to conduct independent research under the supervision of a faculty member. The research project culminates in an honors thesis, which is primary for the award "Anthropology Scholar *Cum Laude*." Higher degree distinctions are recommended only in truly exceptional cases and are based upon the candidate's entire program of honors studies.

Honors candidates must meet the college requirements for an honors degree. They must complete and defend an honors thesis and take 12 hours, which may include 6 hours of thesis, in Honors Studies. The candidate is expected to maintain a minimum 3.25 cumulative grade-point average in anthropology and other course work, to participate in anthropology honors colloquia, and is encouraged to take honors courses outside the anthropology department.

**Requirements for a Minor in Anthropology:** 15 hours including ANTH 1023. At least 9 hours must be in courses numbered 3000 or above. Students who minor in anthropology should consult with an anthropology adviser to select appropriate courses. A student must notify the Department of his or her intent to minor.

**Requirements for a combined major in anthropology and sociology:** 36 hours with a minimum of 15 hours in each subject, to include SOCI 2013, SOCI 3013, SOCI 3303 (or a course in statistics), SOCI 3313, and

SOCI 4023 and ANTH 1013, ANTH 1011L, ANTH 1023, ANTH 3023/3021L, and ANTH 4013. Additional courses are to be selected in consultation with a representative of the field concerned.

**Cartography/Remote Sensing/GIS Specialization:** This program gives students an opportunity to develop expertise in (1) cartography, map design and computer-assisted map production, (2) remote sensing and image interpretation, including photographic systems, sensor systems, and digital image processing, and (3) geographic information systems, including data sources, analytical techniques, and hardware/software systems.

To complete the specialization, a student is required to fulfill certain course requirements.

Required Courses (9 hours):

GEOG 3023, GEOL 4413, and GEOG 4543 (same as ANTH 4543)

Elective Courses (9 hours to be selected from the following):

GEOG 4523, GEOL 5423, GEOG 4553 (same as ANTH 4553), GEOG 4563 (same as ANTH 4563), GEOG 4573 (same as ANTH 4573), GEOG 4593 (same as ANTH 4593), STAT 4003 (or other approved statistics course), CVEG 2053 (or other approved surveying course), CENG 4883

For the combined major in anthropology and African-American studies, see the African-American Studies listing.

For requirements for the M.A. and Ph.D. degrees in anthropology, see the *Graduate School Catalog*.

SEE PAGE 254 FOR ANTHROPOLOGY (ANTH) COURSES

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## ART (ARTS)

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Kristin Musgnug

Chair of the Department  
116 Fine Arts Building  
575-5202

Web Site: <http://www.uark.edu/%7Eartinfo/art.html>

- Professors Brody, Harington, Peven, Stout (K.)
- Associate Professors Golden, Jacobs, Musgnug, Nelson, Newman
- Assistant Professors Laporte, Hulén
- Adjunct Assistant Professors, Kaminsky, Musick, Stout (D.)

### Bachelor of Arts Degree

Transfer students should confer with the chairperson of the department prior to entrance for information concerning entrance requirements and transfer credits.

**Requirements for an Art Major:** A minimum of 40 semester hours, including ARTS 1313, ARTS 1323, ARTS 1013, ARTS 2013, ARTS 4921, and at least 12 hours in art history/criticism to include: ARHS 2913 (Survey I) and 2923 (Survey II), one course from ARHS 4833 (Ancient), ARHS 4843 (Medieval), ARHS 4853 (Italian Renaissance), ARHS 4863 (Northern Renaissance), ARHS 4873 (Baroque), one course from ARHS 4883 (19th Century European), ARHS 4893 (20th Century European), ARHS 4913 (American Art to 1900), ARHS 4923 (American Art Since 1900), ARHS 4933 (Seminar in Contemporary Art), ARHS 4813 (History of Photography). In addition to the freshman year block of courses, the art major must complete a minimum of three semesters in one specialty area of art and a minimum of two semesters in a second area. A faculty-supervised critique of the work of each student is required before commencement. Areas of selection are drawing, painting, sculpture, design, printmaking, ceramics, photography, and graphic design. No art major may present ARTS 1003 or ARHS 1003, or any other art course, to satisfy the college fine arts requirement.

**Requirements for an Art Minor:** A minimum of 18 semester hours to include ARTS 1013, ARTS 1313 or ARTS 1323, ARTS 2003, ARHS



2913 or ARHS 2923, and six additional hours in studio art to be determined through consultation with an art department adviser. A student must notify the department of his or her intent to minor.

**Requirements for a Major in Art with a Concentration in Art History/Criticism:** A minimum of 40 semester hours, including ARTS 1313, ARTS 1323, ARTS 1013, ARTS 2013, ARTS 4921, and ARHS 2913, ARHS 2923. In addition to the preceding requirements, two courses selected from ARHS 4833, ARHS 4843, ARHS 4853, ARHS 4863, ARHS 4873, two courses selected from ARHS 4813, ARHS 4883, ARHS 4893, ARHS 4913, ARHS 4923. In addition, ARHS 4963, Individual Research in Art History, one seminar course in art history or art criticism, and one elective course in art history or studio art. No art major may present ARHS 1003 or ARTS 1003, or any other art course, to satisfy the college fine arts requirement.

**Requirements for a Minor in Art History/Criticism:** A minimum of 18 semester hours to include ARTS 1013, ARTS 1313, ARHS 2913, ARHS 2923, and two additional art history courses exclusive of seminars. A student must notify the department of his/her intent to minor. The minor is especially suited to students majoring in anthropology, English, foreign languages, history, philosophy, and music.

**Requirements for Departmental Honors in Art:** As part of the Honors Studies Program of the J. William Fulbright College of Arts and Sciences, the department of art provides the opportunity for academically superior junior- and senior-level students to acquire broader and deeper knowledge and skills in the visual arts and related disciplines. This is accomplished through independent research projects in studio art and/or art history under the direction of the art faculty. Outstanding achievement is recognized by awarding the distinction "Art Scholar *Cum Laude*." Students may apply for honors studies beginning in the second semester of their sophomore year, and normally will not be accepted into the program after completion of the second semester of their junior year. The department requires each applicant to have a minimum cumulative grade-point average of 3.25 in all college course work, a minimum grade-point average of 3.25 in all course work taken in the department of art, completed ARHS 2913 and ARHS 2923, completed at least 20 semester hours of work in art department courses, and at least 30 semester hours of general education requirements. Included in those hours, a student must complete and defend an honors thesis and take 12 hours, which may include 6 hours of thesis, in honors studies. In addition, the student must submit detailed letters of recommendation from at least two faculty members of the department of art who are willing to work with the student on his or her honors project. Higher degree distinctions take into consideration the student's entire academic career and are recommended for only those students whose honors projects and programs of study demonstrate a truly exceptional degree of creativity and scholarship.

## Bachelor of Fine Arts Degree

**Admission:** Students earning a grade-point average of 3.00 or higher in art, after the completion of the foundations requirements and who have maintained an overall grade-point average of 2.00 are eligible to make application to the B.F.A. degree program. In addition to meeting the required grade-point average, all students must submit, as part of their application, a portfolio of current representative work for evaluation by the art faculty. Acceptance into the B.F.A. program is contingent upon favorable evaluation by the art faculty of the applicant's portfolio. Upon acceptance into the B.F.A. degree program, each student will be assigned a major adviser for the purpose of completing a degree plan, which must meet departmental approval.

Transfer credit will be allowed from other accredited and recognized art departments if the credit earned is compatible with program and course requirements within the UA art department and reflects a grade of "C" or higher. This department will not accept more than 50 percent of

the required B.F.A. professional degree credits from another institution.

**Degree Requirements:** The Bachelor of Fine Arts degree will be awarded to students, who, upon the completion of the approved program, have maintained a 3.00 grade-point average within the UA art department and a 2.00 grade-point average overall. A faculty-supervised critique of the work of each student, once each semester in the program, is required. A senior review and exhibition will be required prior to the granting of the degree.

**Off-campus Study Requirement:** Each student is required to complete an approved off-campus study experience each semester in the program. This may involve a field trip to an urban center that includes visits to major art collections.

**Requirements for the Bachelor of Fine Arts Degree with an Emphasis in Studio Art:** a minimum of 84 semester hours including ARTS 1013, ARTS 1313, ARTS 1323, ARTS 2003, ARTS 2013, ARTS 3333, ARTS 3023 or ARTS 4343, and ARTS 4921, PHIL 4403, plus a minimum of 18 semester hours in the selected studio major, a minimum of 26 semester hours in art electives (must include a minimum of one course in each of the following areas: painting, sculpture, printmaking, graphic design, photography, and ceramics. Up to six credit hours may be taken outside of the department with approval), and at least 15 semester hours in art history including ARHS 2913, ARHS 2923, and ARHS 4943 or ARHS 4933.

**Requirements for the Bachelor of Fine Arts Degree with Emphasis in Art Education:** A minimum of 66 hours to include ARTS 1013, ARTS 1313, ARTS 1323, ARTS 2003, ARTS 2013, ARTS 3333, ARTS 3023 or ARTS 4343, ARTS 4921, PHIL 4403, a minimum of 12 hours in a selected studio major and 6 hours in a selected studio minor, at least 12 hours in art history including ARHS 2913, ARHS 2923, and (ARHS 4943 or ARHS 4933), at least 8 hours studio art electives exclusive of the studio major and minor to be selected from ARTS 3103, ARTS 3203, ARTS 3363, ARTS 3463, ARTS 3503 or ARTS 3523, ARTS 3803.

Students who wish to apply for admission to the internship program in art education must complete the following Stages.

**Stage I:** Complete an Evaluation for Internship. Students must also meet the following criteria to be cleared for the internship:

1. Declare the major in art education in the Fulbright Advising Center, Old Main 101.
2. 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.
3. Obtain a "C" or better in the following pre-education core courses: CIED 1002, CIED 1011, CIED 3023, CIED 3033, ETEC 2001, ETEC 2002L.
4. Obtain a "C" or better in ARED 3613, ARED 3643, ARED 3653.
5. Satisfactory completion of the Evaluation for Internship form. The Evaluation form must be completed by October 1 prior to doing a fall internship or March 1 prior to doing a spring internship. This form is available online at <[http://www.uark.edu/depts/coehp/boyer/Evaluation\\_for\\_internship/Evaluation\\_for\\_Art\\_Internship.doc](http://www.uark.edu/depts/coehp/boyer/Evaluation_for_internship/Evaluation_for_Art_Internship.doc)>.  
The completed form must be returned to the Coordinator of Teacher Education, Peabody Hall room 8, no later than the stated deadline.
6. Complete the B.F.A. degree with a cumulative GPA of 2.50 or higher. The degree must be posted to your University of Arkansas transcript at the Registrar's Office prior to internship.
7. Obtain departmental clearance for internship based on successful completion of portfolios, evaluation for internship, GPA requirements, course work requirements, selected written recommendations, an interview, and/or other requirements specified by your program.
8. Complete licensure packet available from the Coordinator of

Teacher Education, Peabody Hall room 8.

All requirements in Stage I must be met to be cleared for the internship. Please contact the Coordinator of Teacher Education, Peabody Hall, Room 8, College of Education and Health Professions for more information.

### Stage II: Internship.

1. Complete the one-semester internship at an approved site in Washington or Benton counties.
2. Complete Praxis II requirements. See your adviser for completion dates.

**NOTE:** Students should always consult the Coordinator of Teacher Education for any 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.

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.

**Writing Requirement:** The Fulbright College research/analytical writing requirement for art majors, B.A. and B.F.A. degrees, will be fulfilled in art history courses ARHS 4833, ARHS 4843, ARHS 4853, ARHS 4863, ARHS 4873, ARHS 4933, ARHS 4943, ARHS 4963, and ARHS 4973. It may also be an honors thesis in art history (only).

For requirements for the M.F.A. degree program in art, see the *Graduate School Catalog*.

SEE PAGE 257 FOR ART (ARTS) COURSES

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### ARTS AND SCIENCES (ARSC)

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Charles H. Adams  
Chair of Studies  
525 Old Main  
575-4801

Students may enroll in off-campus programs (ARSC) under special circumstances and with the approval of the Associate Dean of Fulbright College.

SEE PAGE 257 FOR ARTS AND SCIENCES (ARSC) COURSES

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### ARTS & SCIENCES PRE-EDUCATION (ASED)

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Fulbright College Advising Center  
101 Old Main  
575-3307  
Web Site: <http://www.uark.edu/~fcac/>  
E-Mail: [fcac@cavern.uark.edu](mailto:fcac@cavern.uark.edu)

Students who desire licensure as high school teachers in one of the areas supported by Fulbright College, except for art and music education majors, must complete a concentration in secondary education in conjunction with their undergraduate B.A. or B.S. degree. Details of additional required courses for a specific major may be found within the major section of the catalog. Initial licensure is available by the University of Arkansas only to students who first complete a standard undergraduate degree with a secondary education concentration, and who then complete the Master of Arts in Teaching (M.A.T.) degree through the College of Education and Health Professions. Students interested in

this program are advised to contact the Fulbright College Advising Center (MAIN 101) in addition to their departmental adviser. They should declare their secondary education concentration no later than the first semester of the sophomore year. Art and music education majors will not be required to complete the M.A.T. program. Students in one of these majors should consult their departmental adviser.

**Requirements for a secondary education concentration (grades 7-12):** Obtain a "C" or better in the following courses:

- CIED 1002, Introduction to Education
- CIED 1011, Intro to Ed Practicum
- ETEC 2001, Educational Technology
- ETEC 2002L, Educational Tech Lab
- CIED 3023, Survey of Exceptionalities  
(PSYC 2003 is a co- or pre-requisite)
- CIED 3033, Classroom Learning Theory  
(PSYC 2003 is a pre-requisite)
- CNED 4003, Classroom Human Relations Skills
- CIED 4201, Seminar: Intro to Professionalism
- CIED 4210, Practicum: Critical and Creative Thinking Skills
- CIED 4211, Seminar: Critical and Creative Thinking Skills
- CIED 4221, Seminar: Structure of the Disciplines

**NOTE:** Consult the Admission Process for Initial Teacher Licensure Stages I-IV in the College of Education and Health Professions section on page 171 for teacher licensure and M.A.T. admission requirements. For more information, please contact the Coordinator of Teacher Education in the College of Education and Health Professions, Peabody Hall, room 8, the Fulbright Advising Center in room 101 of Old Main, or the Secondary Education M.A.T. advisers in the Department of Curriculum and Instruction, Graduate Education, room 205.

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### ASIAN STUDIES (AIST)

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S. Henry Tsai  
Chair of Studies  
416 Old Main  
575-3001

Students may earn a minor in Asian Studies by taking courses in art, anthropology, economics, geography, history, languages, sociology, political science, and literature of Asia.

**Language Requirement:** Students must fulfill the Fulbright College requirement in either Chinese or Japanese. At the discretion of the chair of Studies, proficiency in other Asian languages may also satisfy this requirement.

Beyond the language requirement, students must complete 15 credit hours of approved courses, including at least three hours in the Asian Studies Colloquium (AIST 4003). The following courses may be taken in fulfillment of the elective requirements:

- ANTH 4613, Primate Adaptation and Evolution
- ECON 4633, International Trade Policy
- HIST 3503, Far East in Modern Times
- HIST 4313, History of China to 1644
- HIST 4323, Modern China
- HIST 4343, Modern Japan
- JAPN 4313, Language and Society of Japan
- PLSC 3503, Governments and Politics of East Asia
- PLSC 4823, Foreign Policy of East Asia
- SOCI 3013, Population and Society
- WLIT 4293, Literature of China and Japan

Students may also apply three hours of credit in an approved study-abroad program in an Asian country and three hours of upper-level Chinese or Japanese toward the minor.

Other courses, MGMT 4583, International Management, and Per-

forming Arts of East Asia, may be taken for credit toward the minor with the approval of the chair of Asian Studies.

SEE PAGE 252 FOR ASIAN STUDIES (AIST) COURSES

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### ASTRONOMY (ASTR)

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Claud Lacy  
Chair of Studies  
226 Physics Building  
575-2506

- Professors Lacy, Lieber
- Associate Professor Oliver

SEE PAGE 259 FOR ASTRONOMY (ASTR) COURSES

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### BIOLOGICAL SCIENCES (BISC)

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Dan J. Davis  
Chair of the Department  
Science and Engineering 601  
575-3251  
Web Site: <http://biology.uark.edu/bisc.html>

- Professors James, Roufa, Smith (K.), Talburt, Walker
- Professors Emeriti Dale, Evans (W.), Johnston, Kilambi, Lane, Martin, Meyer, Russert-Kraemer, Sealander, Smith (E.)
- Associate Professors Bailey, Beaupre, Brown, Durdik, Etges, Evans (R.), Henry, Ivey, Kral, Rhoads, Sagers, Spiegel
- Associate Professor Emeritus Wickliff
- Associate Research Professor Krementz
- Assistant Professors Lehmann McNabb, Pinto, Ziegler
- Assistant Research Professors Magoulick, Thompson

The department of biological sciences offers a Bachelor of Science degree for those students who seek a degree with a broad background in the life sciences. The B.S. is recommended for students planning to continue their education in basic or applied biology in graduate or professional school. A Bachelor of Arts degree is available for students who do not plan necessarily on a career as a professional biologist, but who desire a good foundation in the discipline. Students seeking research experience are invited to participate in the college honors program.

**Requirements for a B.S. Degree with a Major in Biology:** A minimum of 124 hours is required, including 40 hours in the major as specified below.

1. Biology Core (13 hours): Cell Biology (BIOL 2533), General Genetics (BIOL 3323), Evolutionary Biology (BIOL 3023), General Ecology (BIOL 3863) and a minimum of one hour of Core Laboratory selected from Cell Biology Laboratory (BIOL 2531L), General Genetics Laboratory (BIOL 3321L), and General Ecology Laboratory (BIOL 3861L).
2. Bibliographic Practicum (BIOL 2001)
3. An additional 26 hours of electives in Biology and/or Biology Related Electives including:
  - a. No more than 8 hours of elective courses at the 1000 level. This includes Principles of Biology. Principles of Biology (BIOL 1543/1541L) is not required for the BS major. Well prepared students, in consultation with their adviser, may opt to begin their coursework with the Core.
  - b. At least 2 elective courses numbered 2000 or higher which are lab courses. This includes Core Labs taken in addition to the basic Core requirement.
  - c. At least 18 hours in courses numbered 3000 or higher, of which

- d. At least 12 hours must be from courses numbered 4000 or higher.
- d. A course meeting the Fulbright College writing requirement. (The means of meeting the writing requirement are listed following the description of the BA with a major in Biology.)

**NOTE:** Biology Related Electives that are not taught by the Department of Biological Sciences must be approved using the "Exception Request—DARS for Major or Minor Requirements."

**Requirements in cognate science and mathematics include the following:**

1. CHEM 1103/1101L (may be completed by advanced placement), CHEM 1123/1121L, CHEM 3603/3601L, CHEM 3613/3611L, CHEM 3813
2. PHYS 2013/2011L, PHYS 2033/2031L or PHYS 2054/2050L, PHYS 2074/2070L
3. MATH 2554 (MATH 2564 is recommended)
4. STAT 2023 or STAT 4003/4001L or equivalent.

**Requirements for a B.A. Degree with a Major in Biology:** A minimum of 124 hours is required, including:

1. BIOL 1543/1541L. Majors may take additional 1000-level courses (BIOL, BOTY, and/or ZOOL), BUT majors may apply a maximum of eight 1000-level credits toward the major.
2. An additional 24 hours of biological sciences, including the following:
  - a. One course from four of the following six areas of specialization, and at least one course from each of the three general areas of biology (BOTY, MBIO and ZOOL)
    - I. Microorganism Biology: BIOL 2533/2531L [lab optional] or MBIO 2013/2011L
    - II. Genetics: BIOL 3323/3321L or MBIO 4233
    - III. Morphology: BOTY 2404, BOTY 4104, BOTY 4424, MBIO 3023, ZOOL 2404 or ZOOL 2814
    - IV. Physiology: BOTY 4304, MBIO 4303 or ZOOL 2213/2211L
    - V. Evolution: BIOL 3023
    - VI. Ecology: BIOL 3863/3861L
  - b. Bibliographic Practicum (BIOL 2001)
  - c. Remaining 8-10 credit hours of biology electives above the 3000 level
3. Requirements in cognate science and mathematics include the following:
  - a. CHEM 1103/1101L, CHEM 1123/1121L, and either CHEM 3613/3611L/3610D or CHEM 3603/3601L, CHEM 3613/3611L
  - b. PHYS 2013/2011L, PHYS 2033/2031L
  - c. MATH 2043 or MATH 2554

**Requirements for Departmental Honors in Biology:** The biological sciences honors program is designed to provide students an opportunity to investigate questions in biology through an expanded reading program and research experience. Biological science majors may apply to enter the program between the second semester of the sophomore year and the end of the junior year. Application is made through both Honors Studies (MAIN 517) and the department of biological sciences (SCEN 601). Applicants must have a 3.25 grade-point average. Students should consult with their adviser to identify and contact a potential faculty research mentor. The student's research activities will then be directed by the departmental faculty member who agrees to sponsor the student.

Students may enroll for up to four hours of credit in BIOL 399VH during the junior year and up to eight hours of credit in BIOL 499V during the senior year. A maximum of six of these credits may be applied toward a major. Participants must complete and defend an honors thesis and take 12 hours in Honors Studies, which may include six hours of thesis. The honors thesis is based on an original research project and presented orally before a committee composed of two faculty from the biological sciences, a person from outside the biological sciences, and a representative from the Honors Council. This committee makes a rec-



ommendation concerning the award of the honors distinction to the Honors Council. Students who successfully complete the departmental honors program usually graduate as “Departmental Scholar *Cum Laude*.” Higher degree distinctions are recommended only in exceptional cases and are based upon the candidate’s entire involvement in the honors program. Completion of an honors thesis fulfills the writing requirement in biological sciences, which precludes credit for BIOL 498V (Senior Thesis) for the same body of work.

**Writing Requirement:** The college writing requirement for majors in biology may be met by one of the following:

1. Completion of an honors thesis,
2. Completion of a senior thesis (BIOL 498V) supervised by a faculty member in biological sciences,
3. Completion of a required term paper with a grade of B or above in a course numbered above 3000 on a topic approved by the instructor, or
4. Completion of a paper, supervised by a faculty member, in Special Problems (BIOL 480V, BOTY 480V, MBIO 480V, or ZOO 480V)

**Requirements for a Minor in Biology:** Students must take BIOL 1543/1541L, or equivalent, and one course from five of the six areas of specialization outlined in the requirements for a B.A. degree in biology. Students must notify the departmental chair of their intent to minor in biology.

**Biology (B.S.) Life/Earth Science Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of “C” or higher. (See page 106.)
3. Complete PSYC 2003 (this course is a pre-requisite to CIED 3033)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

For information on advanced degrees in biology, see the *Graduate School Catalog*.

SEE PAGE 260 FOR BIOLOGY (BIOL) COURSES

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## BUSINESS MINOR FOR NON-BUSINESS STUDENTS

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The Sam M. Walton College of Business minor requires completion of a minimum of 21 required hours of study (including equivalencies) with at least 50% of the courses applied toward the minor taken in residence. Each student must have a 2.00 cumulative grade-point average in the courses offered for the minor.

Fulbright College students seeking a minor in the Walton College must notify the Fulbright College Dean’s Office (MAIN 525).

All students seeking a business minor are required to complete the Walton College computer competency requirement (WCOB 1120) and the following courses:

- ECON 2143, Basic Economics
- WCOB 1023, Business Foundations
- WCOB 1033, Data Analysis and Interpretation

In addition, students must select and complete one of the following seven options:

**Option 1 – General Business**

- Select 12 hours from the following courses  
(at least 6 hours must be 3000-4000 level):
- Any 3000- or 4000-level business courses
  - WCOB 1012, Legal Environment of Business
  - WCOB 2013, Markets and Consumers

- WCOB 2023, Production and Delivery of Goods and Services
- WCOB 2033, Acquiring and Managing Human Resources
- WCOB 2043, Acquiring and Managing Financial Resources

**Option 2 – Information Systems**

A. Students desiring a general business computing area of emphasis must complete the following:

- ISYS 2232, Bus Info Systems (or equivalent)
- ISYS 3333, Info Systems Management
- ISYS 3373, End-User Computing and any course from the following:
  - ISYS 4253, Business Systems Simulation
  - ISYS 3133, Statistical Analysis
  - ISYS 3533, Developing Multimedia Applications

B. Non-business computing majors desiring a business systems analysis and decision support area of emphasis must complete the following:

- ISYS 2263, COBOL Implement. of MIS
- ISYS 3333, Information Systems Management
- ISYS 3293, Systems Analysis and Design and any course from the following:
  - ISYS 3373, End-User Computing
  - ISYS 4253, Business Systems Simulation
  - ISYS 3393, Microcomputer Business Applications
  - ISYS 3283, Advanced COBOL
  - ISYS 3533, Developing Multimedia Applications

**Option 3 – Business Economics**

- ECON 4333, Managerial Economics and an additional 9 hours of 3000- or 4000-level business economics courses

**Option 4 – International Business**

- Select 12 hours from the following:
- ECON 3833, International Trade
  - ECON 3843, Economic Development
  - ECON 4633, International Trade Policy
  - ECON 4643, International Monetary Policy
  - ECON 4533, Comparative Economic Systems
  - ECON 468V, International Economics/Business Seminar
  - FINN, 3703, International Finance
  - MGMT 4583, International Management
  - MKTT 4833, International Marketing
  - TLOG 4643, International Transportation Logistics

**Option 5 – Management**

- MGMT 3563, Managerial Concepts and Organizational Behavior and an additional 9 hours of 3000- or 4000-level management courses (except MGMT 4833)

**Option 6 - Marketing**

- MKTT 3433, Principles of Marketing and an additional 9 hours selected from the following:
- MKTT 3533, Promotional Strategy
  - TLOG 3613, Business Logistics
  - MKTT 4033, Selling and Sales Mgmt.
  - MKTT 4133, Marketing Research
  - MKTT 4553, Consumer Behavior
  - MKTT 4833, International Marketing
  - MKTT 4933, Retail Marketing Strategy
  - MKTT 4943, Retail Buying and Merchandise Control

**Option 7 - Transportation**

- TLOG 3443, Principles of Transportation
- TLOG 3613, Business Logistics, and an additional 6 hours selected from
- TLOG 3623, Purchasing and Inventory Systems
  - TLOG 4633, Carrier Management
  - TLOG 4643, International Transportation Logistics
  - TLOG 4653, Transportation and Logistics Strategy



In addition to the above course requirements, non-business-degree-seeking students seeking a minor should note the following:

1. Business minor students must complete all 1000- and 2000-level courses required for the business minor and be a junior- or senior-level student to enroll in 3000- or 4000-level business courses.
2. All specific course prerequisites must be met. Although business minor students are not required to satisfy the entire pre-business core, they must complete the required courses and any other pre-requisite course specified prior to enrolling in a 3000/4000-level course.
3. ECON 2143 will substitute for ECON 2013/2023 for prerequisite purposes. In addition, students who take both ECON 2013 (Macroeconomics) and ECON 2023 (Microeconomics) will satisfy the economics requirements of the minor.
4. Business minor students are ineligible to take WCOB 3016, Business Strategy and Planning.
5. Students who have taken courses determined to be equivalent to the requirements of ISYS 2013 or ISYS 2232 will receive credit toward the minimum 21-hour requirement for the minor.

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## CHEMISTRY AND BIOCHEMISTRY (CHBC)

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Bill Durham

Chair of the Department

114 Chemistry Building

575-4648

Web Site: <http://www.uark.edu/depts/cheminfo/uarkchem/>

E-Mail: [cheminfo@uark.edu](mailto:cheminfo@uark.edu)

- Distinguished Professors Millett, Pulay, Schäfer, Wilkins
- University Professors Cordes, Hinton, Koeppe
- University Professor Emeritus Fry
- Professors Bobbitt, Davis, Durham, Gawley, Geren, Sears, Yu
- Professors Emeriti Blyholder, Howick, Johnson, Meyer, Thoma
- Associate Professors Allison, Fritsch, McIntosh, Paul, Peng, Sakon, Stites
- Assistant Professor Vicic
- Adjunct Professor Becker
- Adjunct Associate Professors Edkins, Turnbull

Requirements for a B.S. Degree with a Major in Chemistry: A minimum of 40 semester hours in chemistry including CHEM 1213/1211L, CHEM 1223/1221L, (or CHEM 1103/1101L, CHEM 1123/1121L), CHEM 2262, CHEM 2272, CHEM 3504, CHEM 3512L, CHEM 3514, CHEM 3703/3702L, CHEM 3713/3712L, CHEM 4123, CHEM 4213/4211L, CHEM 4723, and at least one additional advanced lecture course with 3514 as a prerequisite is required. On the basis of scores on the Freshman Chemistry Proficiency Examination, a student may be advised to enroll in CHEM 1123/1121L, and upon receiving a grade of "C" or better in these courses, will also receive credit for CHEM 1103/1101L. A minimum of 18 hours of science outside of chemistry and including mathematics through MATH 2574 and physics through PHYS 2074 are required. These mathematics and physics courses are prerequisites for some advanced courses and should be scheduled early in the student's program. Some work in the biological sciences is recommended. This program meets the minimum requirements for certification by the American Chemical Society. Sample schedules may be obtained from the department of chemistry and biochemistry. Prospective students should consult a departmental adviser.

**Requirements for a B.S. Degree with a Major in Chemistry, Biophysical Option:** A minimum of 43 semester hours in chemistry including CHEM 1213/1211L, CHEM 1223/1221L, (or CHEM 1103/1101L, CHEM 1123/1121L), CHEM 2262, CHEM 2272, CHEM 3504, CHEM 3603/3601L-3613/3611L or CHEM 3703/3702L, CHEM 3713/

3712L, CHEM 3514/3512L, CHEM 4213/4211L, CHEM 4853, and 6 hours from CHEM 5813-5843 or CHEM 3813-4723, MATH 2554 and MATH 2564, PHYS 2054/2050L and PHYS 2074/2070L, and 11 hours from the biological sciences, to include BIOL 1543/1541L, BIOL 2533/2531L and one additional lecture course numbered above 3000. The mathematics and physics courses are prerequisites for some advanced courses and should be scheduled early in the student's program.

**Requirements for a B.S. Degree with a Major in Chemistry, Biochemistry Option:** A minimum of 39 semester hours in chemistry including CHEM 1213/1211L, CHEM 1223/1221L (or CHEM 1103/1101L, CHEM 1123/1121L), CHEM 2262, CHEM 2272, either CHEM 3504-3514/3512L or CHEM 3453/3451L, CHEM 3703/3702L, CHEM 3713/3712L, CHEM 4853, CHEM 5813-5843 or CHEM 3813-4723, and either CHEM 4213/4211L or CHEM 4123, additional required courses to include MATH 2554 and 2564, either PHYS 2013/2011L, PHYS 2033/2031L or PHYS 2054/2050L, PHYS 2074/2070L, and 15 hours of biological sciences to include BIOL 1543/1541L, BIOL 2533/2531L, MBIO 2013/2011L, and either MBIO 4233 or BIOL 3323/3321L. The mathematics and physics courses are prerequisites for some advanced courses and should be scheduled early in the student's program.

**Requirements for a B.A. Degree with a Major in Chemistry:** Pre-medical students, prospective secondary school science teachers, and others who do not intend to pursue professional careers in chemistry may satisfy the requirements by completing CHEM 1213/1211L, CHEM 1223/1221L, (or CHEM 1103/1101L, CHEM 1123/1121L), CHEM 2262, CHEM 2272, and 18 additional semester hours in chemistry to include CHEM 3703/3702L-3713/3712L or CHEM 3603/3601L-3613/3611L, and either CHEM 3453/3451L, or the combination CHEM 3504-3514-3512L and two additional lecture courses numbered above 3000. PHYS 2033/2031L and MATH 2554 or MATH 2043 are prerequisites for CHEM 3453, and PHYS 2074 and MATH 2574 are prerequisites for the alternate physical chemistry course sequence CHEM 3504-3514/3512L. These physics and mathematics prerequisite requirements are substantial, and these courses and their prerequisites should be scheduled early in the student's program. Sample schedules may be obtained from the department of chemistry and biochemistry. Prospective students should consult a departmental adviser.

**Requirements for a B.A. Degree with a Major in Chemistry, Biochemistry Option:** A minimum of 32 semester hours in chemistry including CHEM 1213/1211L, CHEM 1223/1221L, (or CHEM 1103/1101L, CHEM 1123/1121L), CHEM 2262, CHEM 2272, either CHEM 3453/3451L or CHEM 3504-3514-3512L, either CHEM 3603/3601L-3613/3611L or CHEM 3703/3702L-3713/3712L, CHEM 4853, and either CHEM 5813-5843 or CHEM 3813-4213/4211L or CHEM 3813-4123 or CHEM 3813-4723, MATH 2554 or MATH 2043, PHYS 2013/2011L-2033/2031L or 2054-2074, and 11 hours from the biological sciences, at least 3 hours of which must be upper-level courses. The mathematics and physics courses are prerequisites for some advanced courses and should be scheduled early in the student's program.

**Writing Requirement:** Chemistry majors will satisfy the Fulbright College writing requirement by satisfactory completion of the formal research/analytical reports required in Physical Chemistry Laboratory, CHEM 3451L or CHEM 3512L.

**Requirements for Departmental Honors in Chemistry:** Students with good academic backgrounds and strong interests in research are encouraged to participate in the department of chemistry and biochemistry honors program. Entrance into the program is normally during the sophomore year or the first semester of the junior year, and a minimum cumulative GPA of 3.25 is required. Entrance is initiated by consulting the faculty academic adviser who will help arrange conferences with potential faculty research project advisers. When there is agreement between the student and the adviser on a research project or area, an Honors Advisory Committee is set up to supervise the honors candi-

date's program. The heart of the program is the research project, but students are encouraged to broaden their experience beyond required courses within chemistry, the natural sciences, the social sciences, and the humanities. Participation in Honors Colloquia, honors sections of regular courses, and chemistry departmental and divisional seminars is especially recommended. All honors candidates enroll in the spring semester Honors Seminar (CHEM 4011H), and senior honors students must make at least one seminar presentation. All honors candidates will be required to complete and defend an honors thesis and take 12 hours (which may include 6 hours of thesis) in Honors Studies. The thesis is required in the spring semester of the senior year, followed by an oral presentation. On the basis of these written and oral reports and their evaluation of all aspects of the student's honor program, the candidate's Honors Advisory Committee will recommend whether or not the distinction "Chemistry or Biochemistry Scholar *Cum Laude*" should be awarded. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Requirements for a Minor in Chemistry:** 18 hours of courses above the 1000 level including CHEM 2262, CHEM 2272, CHEM 3603/3601L, CHEM 3613/3611L, CHEM 3453, and a 3-hour course at the 3000 - 4000 level. A student must notify the department of his or her intent to minor.

**Chemistry (B.S.) Physical/Earth Science Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

**Chemistry (B.A.) Physical/Earth Science Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

SEE PAGE 265 FOR CHEMISTRY (CHEM) COURSES

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**CLASSICAL STUDIES (CLST)**

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Daniel B. Levine

Chair of Studies

502 Kimpel Hall

575-2951

Web Site: <http://www.uark.edu/ua/metis2/>

- Professors Levine, Spellman, Waligorski
- Associate Professors Coon, Engels, Fredrick

**Requirements for a Major in Classical Studies:** The College offers a major in classical studies leading to the Bachelor of Arts degree. Students should select appropriate courses from the following three areas:

1. 15 hours of Ancient Greek or 15 hours of Latin.
2. 18 hours of additional work in classical languages and/or specific classical studies-related electives, to be selected from the following courses: ARCH 2233, ARHS 4833, ARHS 4843, CLST 1003, CLST 1013, HIST 4003, HIST 4013, HIST 4023, HIST 4043, HIST 4053, PHIL 4003, PHIL 4013, PHIL 4023, PLSC 3953, WLIT 2323.

No more than nine hours of electives from the medieval period may be applied to the major requirements.

3. Three hours of a classical studies colloquium (CLST 4003H).

**Requirements for a Minor in Classical Studies:** Students should select appropriate courses from the following areas:

1. 9 hours of Ancient Greek or Latin courses numbered above 2000,
2. 6 hours of additional work in classical languages and/or specific classical studies-related electives, to be selected from the following courses: ARCH 2233, ARHS 4833, ARHS 4843, CLST 1003, CLST 1013, HIST 4003, HIST 4013, HIST 4023, HIST 4043, HIST 4053, PHIL 4003, PHIL 4013, PHIL 4023, PLSC 3953, WLIT 2323,

3. Three hours of a classical studies colloquium (CLST 4003H).

**Requirements for Honors in Classical Studies:** The Honors Program in Classical Studies gives students of high ability the opportunity to strengthen their study of classics by intensifying their experience with ancient languages and cultures.

In addition to the requirements for graduation with a major in classical studies and the general college requirements for a B.A. degree, honors candidates in classical studies must

1. be accepted as honors candidates by the Classical Studies Committee,
2. complete at least three semesters in a second classical language,
3. enroll in at least two 1-hour units of CLST 399VH and pursue independent-study topics under the guidance of classical studies faculty,
4. enroll for two hours of CLST 399VH and write an honors thesis, and
5. defend and discuss their entire honors program in an oral examination.

Successful completion of the requirements will be recognized by the award of the distinction "Classical Studies Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

SEE PAGE 270 FOR CLASSICAL STUDIES (CLST) COURSES

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**COMMUNICATION (COMM)**


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Robert M. Brady

Chair of the Department

417 Kimpel Hall

575-3046

Web Site: <http://www.uark.edu/depts/comm/>

E-Mail: [comm@uark.edu](mailto:comm@uark.edu)

- Professors Frentz, Rogers, Rushing, Smith (S.), Webb
- Research Professor Pincus
- Professor Emeritus Rea
- Associate Professors Allen, Amason, Bailey, Brady, Rosteck, Scheide, Wicks
- Assistant Professor Warren
- Research Assistant Professor Smith (L.)
- Assistant Professor Emeritus Galloway
- Adjunct Assistant Professors Cowling, Hemphill

As a subject for academic study, communication bridges the humanities and the social sciences. It focuses on relationships — personal, group and societal — and the factors and processes that affect important relationships. Friendships and families, business relationships and political systems, cultural interaction and technological advances are important areas of study in communication. Communication students may concern themselves with the dynamics of interpersonal persuasion, the effects of media technologies, the nature of gender stereotypes, the function of roles within the family, the structure of organizational authority, the influence of cultural myths, the impact of social movements, and the history of rhetoric. Because the program offers many diverse interests, there is a place for anyone with a genuine curiosity about human communication and its effect upon society.

Communication majors from recent graduating classes now hold responsible positions in government and public affairs, in management, marketing, and public relations within private business, and in television and mass media organizations. Many others are successfully pursuing further education in graduate and professional schools.

The department of communication offers general studies of the discipline, as well as concentration in three specific emphasis areas:

1. rhetoric and public communication,
2. interpersonal, small group, and organizational communication, and
3. mass communication

Students may also select a program for acquisition of teaching certification in the field.

**Admission Requirements for a Major in Communication:** For standing as a major, entering freshmen must have ACT composite scores of 20 or higher, and those transferring into the program after the first semester of college study must have a cumulative grade-point average of 2.00 or higher.

**University and College Requirements for a Major in Communication:** 36 semester hours in communication courses, to include COMM 2333, COMM 3343, COMM 3443, COMM 3673, at least 12 additional hours chosen from COMM courses above 3000. Communication courses used to satisfy the College or University Core requirements will not count toward the major. To graduate, students must have a cumulative grade-point average of 2.00 or above within the major.

**Writing Requirement:** The college writing requirement may be satisfied by a research paper submitted for an upper-division communication class and approved by the chairman of the department.

**Requirements for Departmental Honors in Communication:** The Honors Program in communication gives an opportunity for a student to achieve an additional level of intellectual growth and a satisfaction of accomplishment. A student engages in independent research and writing, under the supervision of a member of the communication faculty,

and participates in special honors classes, seminars, and colloquia.

Faculty recognize outstanding achievement by a student by recommending that the bachelor's degree in communication be awarded with the distinction "Communication Scholar *Cum Laude*." Higher distinctions may be awarded to truly outstanding students based upon the whole of their academic program and quality of honors research.

To enter the Honors Program, a student must possess a 3.25 minimum grade-point average on all academic work and receive the recommendation of a faculty member in communication to the Honors Council of Fulbright College. A student may pursue an independent research program of a historical, critical, descriptive, or experimental nature, within any of the areas of rhetorical or communication theory, history of public address, interpersonal, small-group, or organizational communication, persuasion, argumentation, political communication, freedom of speech, communication education, or in any closely related areas of inquiry. A student interested in mass communications, broadcasting, or film may choose to pursue either a research project or a creative study. In addition to satisfying the general college and departmental requirements for a bachelor's degree, a student must satisfy departmental honors requirements, which include the following:

1. become an honors candidate no later than the first semester of the junior year of study,
2. enroll in COMM 399VH, Honors Course, a minimum of one hour of credit each semester during the junior-senior years,
3. achieve a 3.25 minimum grade-point average in communication,
4. take 12 hours, which may include 6 hours of thesis in Honors Studies, and
5. write and defend before a faculty examining committee a thesis based on the investigative or creative project undertaken in COMM 399VH.

For a full description of the Honors Program and its requirements, a student should consult with an adviser in the department of communication.

**Requirements for a Minor in Communication:** 18 hours including COMM 2303 and COMM 2323. At least 9 hours must be numbered 3000 or above. A student should consult with an adviser in the Department of Communication for the selection of appropriate courses. A student must notify the department of his or her intent to minor.

**Communication (B.A.) Drama/Speech Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003 (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following drama courses are recommended for drama/speech licensure, and with approval of adviser, may be used as electives in student's program of study:
  - DRAM 1223, Introduction to Dramatic Art
  - DRAM 1333, Introduction to Design and Technical Production
  - DRAM 1683, Acting I
  - DRAM 272V (3), Theatrical Production
  - DRAM 3653, Directing I

SEE PAGE 271 FOR COMMUNICATION (COMM) COURSES



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## COMPUTER SCIENCE AND COMPUTER ENGINEERING

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Aicha Elshabini  
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575-6197  
Web Site: <http://www.csce.uark.edu/>

- Professors Brewer, Elshabini, Crisp, Lala, Skeith, Starling
- Associate Professors Apon, Beavers, Deaton, Li, Lusth, Panda
- Assistant Professors Hexmoor, Parkerson, Simonson, Thompson
- Instructors Baker, Holmes, Johnson, McPherson, Wiggins

The department offers the Bachelor of Science and Bachelor of Arts degrees in computer science, the Bachelor of Science degree in computer engineering, and Master of Science and doctor of philosophy degrees in both computer science and computer engineering. The undergraduate computer engineering degree is described in the listing for this department in the College of Engineering section of this catalog. The graduate degrees are described in the *Graduate School Catalog*.

The educational objectives of the department are to produce graduates who are recruited in a competitive market and make valuable contributions to a wide variety of industries, particularly in computer and information technology, succeed in graduate or professional studies in such areas as engineering, science, law, medicine, or business, if pursued, pursue life-long learning and continued professional development, undertake leadership roles in their profession, in their communities, and in the global society.

To meet these objectives, the computer science curriculum requires the successful completion of a pre-professional program that covers the essential foundations in mathematics, science and introductory computer and programming courses. Successful completion of the pre-professional program is defined as a minimum grade point average of 2.75 for all courses comprising the pre-professional curriculum, but no less than a grade of "C" on any course. If courses are repeated, the best attempt is used in computing the grade-point average.

A degree in computer science provides a unique diversity in career choices. Computer science graduates can design, implement, or manage computer systems, as well as adapt computers to new applications. Computer science core courses include the fundamentals of programming concepts, data structures, operating systems, boolean and digital logic, and programming languages.

**Requirements for a Major in Computer Science, Bachelor of Science Degree:** At least 47 hours in the major department including CSCE 1113/1111L, CSCE 1123/1121L, CENG 2113, CSCE 2133, CSCE 2143, CSCE 3213, CSCE 3313, CSCE 4323, CSCE 4413, CSCE 4513, and CSCE 4313, 12 hours of electives (at least nine at the senior level) to be selected from CSCE 390V, CSCE 4523, CSCE 4753, CSCE 4253, CSCE 4613, CSCE 490V, CSCE 4912H, CSCE 498V, CENG 4813, CENG 4423, CENG 4533, ELEG 3923, ELEG 4683, ELEG 4943, MATH 3353.

The mathematics, statistics, and science requirements for the B.S. degree in computer science are MATH 2103, MATH 2554, MATH 2564, MATH 3083, MATH 3103 and STAT 4003/4001L or STAT 3013 and 12 hours of laboratory sciences which include a two-course sequence in a single laboratory science. One of the courses used to satisfy this requirement must be either CHEM 1103/1101L or PHYS 2054/2050L. The courses used to satisfy the science requirement must be chosen from the natural sciences and must be approved by the department, only courses that may be used to satisfy the requirements for a B.S. degree in the department offering the course will be approved.

The preprofessional program requirements for the B.S. degree in computer science are MATH 2554, MATH 2564, ENGL 1013, ENGL

1023, CSCE 1113 and 1111L, CSCE 1123 and 1121L, and a 3 hour science course with a laboratory.

**Requirements for Major in Computer Science, Bachelor of Arts Degree:** At least 30 hours in computer science including CSCE 1113/1111L, CSCE 1123/1121L, CSCE 2143, CSCE 3313, and CSCE 4313 plus 13 hours of electives to be selected from a list of courses numbered 3000 or higher offered by the department.

The mathematics requirements of the degree are MATH 2043 or MATH 2554, MATH 2103, MATH 3103.

The preprofessional program requirements for the B.A. degree in computer science are MATH 2103, MATH 2043, ENGL 1013, ENGL 1023, CSCE 1113 and 1111L, CSCE 1123 and 1121L, and a 3 hour science course with a laboratory.

**Writing Requirement:** The Fullbright College research paper requirement for either degree program may be fulfilled in CSCE 4313.

**Requirements for Departmental Honors in Computer Science:** The Departmental Honors Program in Computer Science is designed for the superior student and is intended to help the student develop a more comprehensive view of the nature of computer science. The program provides a vehicle for the recognition of the achievements of work beyond the usual course of study. Acceptable performance in the program will earn the student the distinction "Computer Science Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the candidate's whole program of honors studies.

The department considers the following requirements necessary for graduation with honors:

1. The candidate must satisfy the requirements set forth by the Honors Council,
2. A student must obtain at least a 3.50 grade-point average in the required computer science and computer engineering courses
3. Students must complete 7 hours of Honors credit in the major, which includes 4 hours of Honors Thesis taken as two successive semesters of CSCE 4912H and 3 hours of non-thesis.

**Requirements for a Minor in Computer Science:** CSCE 1113/1111L, CSCE 1123/1121L, CSCE 2143, CSCE 3313, and either CSCE 2133 or CSCE 4313.

For requirements for the M.S. degree in computer science, see the *Graduate School Catalog*.

SEE PAGE 272 FOR COMPUTER SCIENCE (CSCE) COURSES

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## CRIMINAL JUSTICE (CMJS)

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(See Sociology)

SEE PAGE 270 FOR CRIMINAL JUSTICE (CMJS) COURSES

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## DANCE (DANC)

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(See Drama)

SEE PAGE 276 FOR DANCE (DANC) COURSES



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**DRAMA (DRAM)**


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D. Andrew Gibbs

Chair of the Department

619 Kimpel Hall

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Web Site: <http://www.uark.edu/depts/drama>E-Mail: [drama@cavern.uark.edu](mailto:drama@cavern.uark.edu)

- Professors Brusstar, Gibbs, Gross
- Associate Professors Herzberg, Martin, Riha
- Assistant Professors Dwyer, Gorden, Tyndall

**Requirements for a Major in Drama:** A minimum of 40 semester hours to include 18 semester hours in courses numbered 3000 and above or the prescribed program for teacher licensure in speech education. All drama majors must enroll in the following courses:

DRAM 1223 (Introduction to Dramatic Art),  
 DRAM 1313 (Stage Technology I: Costumes and Makeup),  
 DRAM 1311L (Stage Technology I Lab),  
 DRAM 1323 (Stage Technology II: Scenery and Lighting),  
 DRAM 1321L (Stage Technology II Lab),  
 DRAM 1683 (Acting I),  
 DRAM 2683 (Acting II),  
 DRAM 3653 (Directing I),  
 DRAM 2313 (Introduction to Design)

and a choice of ONE course selected from DRAM 3213 (Costume Design I), DRAM 3733 (Lighting Design I), DRAM 3903 (Make-up Design) or DRAM 4653 (Scene Design I),  
 DRAM 4233 (History of Theatre I),  
 DRAM 4333 (History of Theatre II),

And six hours of courses chosen from DRAM 3803 (Development of the Drama), DRAM 4733 (Dramatic Criticism), DRAM 3433 (Stage Speech), DRAM 4463 (African American Theatre History), DRAM 491 (Special Topics in Script Analysis/Synthesis), one design course, not previously taken, chosen from among DRAM 3213, DRAM 3733, DRAM 3903, DRAM 4653.

In addition, all drama majors are required to take 2 credit hours of Theatre Practicum, DRAM 3001. It is expected that one hour of theatre practicum will be taken per academic year. In consultation with the adviser, each student may select the focus area of each practicum credit, but no more than 2 credits may be earned for performance assignments. No drama major may present DRAM 1003 to satisfy the College fine arts requirement.

**Writing Requirement:** The Fulbright College research/analytical paper requirement for drama majors will be fulfilled in DRAM 4233, DRAM 4333, DRAM 4453, or DRAM 4733. Satisfactory completion of an honors project or senior thesis may fulfill the requirement.

**Senior Progress Review:** All drama majors are required, in the semester before graduation, to successfully complete the Senior Progress Review, a faculty assessment of each student's accomplishments in performance and production.

**Requirements for Departmental Honors in Drama:** The Departmental Honors Program in Drama provides upper-division undergraduate students with an opportunity to formally participate in creative and scholarly activities in theatre. Honors candidates engage in independent study and research under the guidance of the drama faculty and participate in special honors seminars and colloquia. Outstanding student achievement will be recognized by awarding the distinction "Drama Scholar *Cum Laude*" at graduation. In addition to satisfying the general college requirements for the bachelor's degree with Honors, honors candidates in drama must

1. become a candidate no later than the second semester of their junior year,

2. enroll in honors colloquia when available,
3. enroll in six hours of honors research DRAM 399VH,
4. complete and defend in oral examination an honors thesis based upon the project carried out in DRAM 399VH, and
5. achieve a cumulative grade-point average of 3.25. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the candidate's entire academic program. Usually these are awarded only to students with a cumulative grade-point average of 3.50 or above, whose project demonstrates a high degree of creativity and scholarship.

**Requirements for a Minor in Drama:** A minimum of 18 semester hours in Drama, including DRAM 1223. One of the following courses or course/lab combinations is also required: DRAM 1313 and 1311L, or DRAM 1323 and 1321L, or DRAM 1683. The remaining hours must be selected from courses at the 3000- or 4000-level, the specific courses to be determined by the student in consultation with a drama department faculty adviser. The student must notify the department of his or her intent to minor.

**Drama (B.A.) Drama/Speech Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for drama/speech licensure: (With approval of adviser, these courses may be used as electives in student's program of study.)  
 COMM 2303, Public Speaking  
 COMM 2373, Introduction to Debate  
 COMM 4793, Directing Forensics  
 Any other upper-level Communications course

For requirements for the M.A. and M.F.A. degrees in drama, see the *Graduate School Catalog*.

SEE PAGE 277 FOR DRAMA (DRAM) COURSES

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**ECONOMICS (ECON)**


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Joseph Ziegler

Department Chair

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575-ECON (3266)

Web Site: <http://waltoncollege.uark.edu/ECON/default.asp>

- Phillips Petroleum Chair of International Business and Economics  
Distinguished Professor Murray
- Lewis E. Epley Jr. Professor Ferrier
- Professors Britton, Curington, Dixon, Farmer, Gay, McKinnon,  
Ziegler
- Adjunct Professor Millar
- Associate Professors Horowitz and Sonstegaard
- Assistant Professors Deck, Kali, Mendez

Requirements for a Major in Economics: 30 semester hours, including ECON 2143 or ECON 2013 and ECON 2023, ECON 3033, ECON 3133, ECON 4743, and ECON 4033.

**Requirements for a Major in Economics with Emphasis in International Economics and Business:**

1. 30 semester hours of courses, including ECON 2013, ECON 2023,

- ECON 3033, ECON 3133, ECON 4633, ECON 4643, and 12 hours of international economics and business electives that may be selected from ECON 3843, ECON 4533, ECON 4653, ECON 468V, MGMT 4583, or other courses approved by the departmental adviser. Course pre-requisites for non-economics international business courses will count toward this 12-hour requirement. Thus, if a student wants to take MKTT 4833 International Marketing as an international economics and business elective, he/she also must take the prerequisite MKTT 3433 Principles of Marketing. These two courses will satisfy 6 hours of the elective requirement,
2. 9 hours of upper-division course work in Fulbright College that focuses on a country or region of the world related to the foreign language, which might include upper-division courses in the same language, which should emphasize literature or cultural topics. Courses must be approved by the departmental adviser. Students who meet the requirements of the Fulbright College area studies programs in Asian Studies, Russian and Soviet Studies, Latin American Studies, or European Studies will be considered to have fulfilled this requirement,
  3. MATH 2043 and MATH 2053 or MATH 2554 and MATH 2564 – these courses fulfill the Fulbright College mathematics requirement.
  4. 9 hours of business/stat courses to include ISYS 2013 or STAT 2303 and ACCT 2013 and ACCT 2023,
  5. 6 hours of a foreign language at the intermediate level, or above, and
  6. 3 hours of upper-division foreign language in the same language covering business communications, or equivalent. Any student whose minimum 6-hour requirement under (# 5) above includes an upper-division course may choose to include business communications among the 6 hours of required university course work in the foreign language.

**NOTE:** It is strongly recommended that economics majors who plan to continue their studies at the graduate level take two semesters of calculus (MATH 2554 AND MATH 2564) and linear algebra (MATH 3083).

**Writing Requirement:** The Fulbright College writing requirement for economics majors will be fulfilled by the research/analytical paper required in ECON 4033. For economics majors who elect to emphasize international economics and business, the writing requirement will be fulfilled by the research/analytical paper required in ECON 4633 or 4643.

**Requirements for Departmental Honors in Economics:** The Departmental Honors program provides upper-division students the opportunity to engage in independent study or research under the guidance of an individual member of the faculty. In addition to satisfying the general college requirements for the bachelor's degree with honors, honors candidates in economics are required to complete and orally defend an honors thesis based upon independent study under ECON 399VH (for 3 to 6 hours) and to have a minimum grade-point average of 3.25. Outstanding student achievement will be recognized by awarding the bachelor's degree with the distinction "Economics Scholar *Cum Laude*." Higher distinctions may be awarded to truly outstanding students based upon the whole of their academic program and quality of honors research.

The following courses, among others in business administration, are given credit toward an economics major for the B.A. degree. For description of these courses, see College of Business Administration section of this catalog.

FINN 3033, Money and Banking  
 FINN 3133, Commercial Banking  
 FINN 3043, Principles of Finance  
 ISYS 2013, Business Statistics

For the combined major in economics and African-American studies, see page 116.

**Requirements for a Minor in Economics:** 18 hours in economics. Required courses are ECON 3033, Microeconomic Theory, and ECON 3133, Macroeconomic Theory, plus 12 additional hours in economics, six of which must be in courses numbered 3000 or above.

**NOTE:** ECON 2013 and ECON 2023, or ECON 2143, are prerequisites to all economics courses numbered above 3000.

**Economics (B.A.) Social Studies Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003 (this course is a pre-requisite to CIED 3033)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, may be used as electives in student's program of study:
  - 6 hours of geography, including GEOG 1123, Human Geography
  - 9 hours of American history, including HIST 2003, HIST 2013
  - 3 hours of Sociology or Anthropology
  - PLSC 2003, American National Government
  - PLSC 2203, State and Local Government OR
  - PLSC 3223, Arkansas Politics
  - PSYC 2003, General Psychology
6. The following courses are specifically required for licensure:
  - ECON 2013 or ECON 2023 or ECON 2143
  - HIST 3383, Arkansas History
7. Students wanting to teach social studies in middle school should consult with a middle level adviser in the College of Education and Health Professions.

SEE PAGE 278 FOR ECONOMICS (ECON) COURSES

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**ENGLISH (ENGL)**

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- Distinguished Professor Guilds
- Distinguished Professor Emeritus Kinnamon
- University Professor Williams
- University Professors Emeriti Harrison, Van Scyoc
- Professors Booker, Brinkmeyer, Burris, Candido, Cochran, DuVal, Giles, Heffernan, Montgomery, Quinn, Sherman, Talburt, Wilkie
- Professors Emeriti Bennett, Bolsterli, Guinn, Hart, Rudolph, Whitehead
- Associate Professors Adams (C.), Gilchrist, Hays, Jimoh, Kahf, MacRae, Marren, Slattery, Stephens
- Associate Professors Emeritus Park
- Assistant Professors Adams (R.), Armstrong, Cohen, McCombs
- Instructors Clark, Lane

The department of English offers a major in English, a minor in English, and a combined major in English and journalism.

The major in English is suitable for many purposes, both professional and cultural. By properly selecting courses, the student may prepare for postgraduate work in literature and language, meet the English

requirements for secondary teaching licensure, develop writing skills, both in creative and in expository writing, obtain appropriate pre-professional training for areas such as law, or study broadly in the literary culture of English-speaking peoples. A rich variety of courses is offered, and there is opportunity within the major for any student to explore areas of special interest: for example, American literature, the Renaissance, drama, the English language, and modern and contemporary literature.

**Requirements for a Major:** 36 semester hours (not counting ENGL 0003, ENGL 1013, ENGL 1023, and ENGL 2003) to include Introduction to Literature (ENGL 1213), twelve hours of History of Literature in English (ENGL 2133, ENGL 2143, ENGL 2153, ENGL 2163), three hours of Introduction to Shakespeare (ENGL 3653), three hours chosen from any course above 3000 in Medieval, Renaissance (exclusive of Shakespeare), Restoration, or Eighteenth-century Literature, three hours chosen from any course above 3000 in Nineteenth-century or Twentieth-century English or American Literature, three hours of Senior Research Seminar (ENGL 4213) or Senior Honors Seminar (ENGL 4223H: restricted to students in departmental or college honors programs), at least nine additional hours chosen from ENGL courses above 3000, WLIT courses above 2333, and ENGL 2253.

**Writing Requirement:** All upper-division English courses require a research or analytical paper except the courses in creative writing (ENGL 3013, ENGL 4013, ENGL 4023, ENGL 4073). For this reason all students who fulfill the requirements for a major in English thereby fulfill the Fulbright College writing requirement.

**Requirements for a Major with a Concentration in Creative Writing:** 36 semester hours (not counting ENGL 0003, ENGL 1013, ENGL 1023, and ENGL 2003) to include three hours of Poetry (ENGL 3203), three hours of Fiction (ENGL 3213), three hours of Creative Writing I (ENGL 2023), three hours of Creative Writing II (ENGL 3013), three hours of Poetry Workshop (ENGL 4013) or Fiction Workshop (ENGL 4023), twelve hours of History of Literature in English (ENGL 2133, ENGL 2143, ENGL 2153, and ENGL 2163), three hours of Introduction to Shakespeare (ENGL 3653), and six additional hours chosen from ENGL courses above 3000, WLIT courses above 2333, and ENGL 2253.

**Requirements for Departmental Honors in English:** The Departmental Honors Program in English allows upper-division undergraduates to strengthen their study of English and adapt it to their interests. Honors candidates enroll in special courses and do directed independent study and research. In addition to the college and departmental requirements for the major in English and the general college requirements for the B.A. degree, each honors candidate in English must

1. be accepted as honors candidates by the department,
2. complete at least nine hours of honors course work, at least three hours of which must be in English,
3. enroll in at least three hours of Senior Thesis ENGL 498V and write an honors thesis, either a critical study or a creative writing project, and
4. defend the candidate's entire honors program in an oral examination.

Candidates may petition to enroll in a departmental graduate seminar. Candidates who complete the honors program with merit will graduate with the distinction "English Scholar *Cum Laude*." The distinctions of *Magna Cum Laude* and *Summa Cum Laude* will be awarded only for exceptional work and will be based on the candidate's entire honors program.

**Requirements for the Minor:** 18 hours of English (not counting ENGL 0003, ENGL 1013, ENGL 1023, and ENGL 2003) to include any nine hours of History of Literature in English (ENGL 2133, ENGL 2143, ENGL 2153, or ENGL 2163), and nine additional hours chosen from ENGL courses above 3000, WLIT courses above 2333, and ENGL 2253. ENGL 1213 is recommended but not required.

**Combined Major in English and Journalism:** The English requirements for the combined major in English and journalism are as follows: 24 semester hours (not counting ENGL 0003, ENGL 1013, ENGL 1023, and ENGL 2003) to include any nine hours of History of Literature in English (ENGL 2133, ENGL 2143, ENGL 2153, ENGL 2163), and 15 additional hours chosen from ENGL courses above 3000, WLIT courses above 2333, and ENGL 2253. ENGL 1213 is recommended but not required.

The journalism requirement for the combined major in English and journalism is as follows: 21 semester hours including JOUR 1023, JOUR 1013, JOUR 3013, JOUR 3023, and JOUR 3633. Other sequences of courses are available for students emphasizing broadcast journalism.

**Assessment Requirement:** Every senior English major must take the program assessment exam administered by the department each spring semester to graduate. Exam results will not affect GPA, although the student's score will be noted on his or her permanent academic record. This requirement may be waived in extraordinary circumstances by the department's Director of Undergraduate Studies. Contact your adviser for more information.

#### **English (B.A.) Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003 (this course is a pre-requisite to CIED 3033)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, these courses may be used as electives in student's program of study:
  - ENGL 3183, Modern English Syntax and Style OR
  - ENGL 4003, English Language and Composition for Teachers
6. Students wanting to teach English in middle school should consult with a middle-level adviser in the College of Education and Health Professions.

**English Course Numbering:** The section of the catalog titled "Course Descriptions" describes the function of the first digit of a course number. In addition to that, the following table describes the function of the second digit in course numbers that generally applies to English courses.

- 0 – writing courses.
- 1 – broad surveys of English literature, linguistics, folklore.
- 2 – criticism, special topics.
- 3 – American literature.
- 4 – Medieval.
- 5 – 16th-century literature.
- 6 – 17th-century literature.
- 7 – 18th-century literature.
- 8 – 19th-century literature.
- 9 – 20th-century literature.

For requirements for advanced degrees, see the *Graduate School Catalog*.

SEE PAGE 283 FOR ENGLISH (ENGL) COURSES



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**EUROPEAN STUDIES (EUST)**


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Mark E. Cory

Director of Studies

518 Kimpel Hall

575-5939

Web Site: <http://www.uark.edu/depts/eust/>

- Professors Booker (English), Bukey (history), Cory (German), Dixon (geography), DuVal (English), Eichmann (French), Gay (economics), Hanlin (German), Heffernan (English), Kelley (political science), Kennedy (history), McCartney (anthropology), Montgomery (English), Pritchett (Spanish), Purvis (journalism and political science), Ricker (German), Waligorski (political science), Wilkie (English)
- Associate Professors Adler (philosophy), Bailey (communication), Davidson (geography), Edwards (philosophy), Arenberg (French), Jacobs (art), Senor (Philosophy), Sonn (History)
- Assistant Professor Condray
- Instructor Rozier (Italian)

Courses are offered in European studies, broadly defined as the study of the geography, culture, history, language, and politics of central Europe, including the British Isles.

Students wishing to maximize their knowledge of European studies and wishing to prepare for graduate training and/or employment in the private sector or government in positions related to the area may earn a combined major in European studies together with a major in another discipline. Students are required to coordinate their academic programs both with their advisers in the major department and with the director of the European Studies program. New students entering the program are required to notify both the major adviser and the director of studies of their intention to participate. Freshmen and sophomores considering this program are advised to begin their study of an appropriate foreign language as early as possible.

**Requirements for a Minor in European Studies:** Students wishing to minor in European studies must fulfill the colloquium (EUST 4003) and language requirements described below under the requirements for the major, and must complete at least 12 hours from among the electives listed below. A maximum of six hours of electives may be submitted from any one department.

**Requirements for a Major in European Studies: Language Requirement:** Students must complete the equivalent of a third year of a modern European language, e.g., six hours of advanced 3000- or 4000-level work in French, German or Spanish. Less commonly taught languages such as Portuguese or Italian may be used, subject to the availability of courses. Three to six hours in an approved study abroad program in Europe may substitute for all or part of this requirement. For native speakers of a European language other than English, this requirement is waived.

**European Studies Colloquium:** Students must complete three to six hours of European Studies Colloquium (EUST 4003).

**Electives:** Students must complete at least 18 hours of credit in addition to the language requirement and the colloquium (EUST 4003) from among the following or in individualized studies under the direction of faculty participating in the program. Students choosing to take individualized reading or directed research courses as part of the major or minor must obtain the approval of the director of the area studies program and their major adviser. In addition, the following conditions apply:

1. a maximum of nine hours may be submitted from any one department, and
2. a maximum of six hours may be submitted from courses taken in the student's major department.

The following courses may be taken in fulfillment of elective requirements:

**Anthropology**

ANTH 4253, People and Cultures of the World Regions  
(Region varies, counts for EUST if region is Europe)

**Art History**

ARHS 4873, Baroque Art

ARHS 4883, 19th Century European Art

ARHS 4893, 20th Century European Art

ECON 4533, Comparative Economic Systems

**English**

Any 3000- or 4000-level course in 18th, 19th, or 20th century British, Irish, Scots, or continental literature, any comparative literature course with significant European content.

**Foreign Languages**

Any 3000- or 4000-level French, German, Italian or peninsular Spanish literature or civilization course.

**Geography**

GEOG 2203, Developed Nations (Provided course has significant European content.)

GEOG 4243, Political Geography

GEOG 4783, Geography of Europe

**History**

HIST 3443, Modern Imperialism

HIST 3533, World War II

HIST 4103, Europe in the 19th Century

HIST 4113, 20th Century Europe to 1939

HIST 4133, Society and Gender in Modern Europe

HIST 4143, Intellectual History of Europe Since the Enlightenment

HIST 4183, Great Britain 1780-1914

HIST 4193, Great Britain 1901-1982

HIST 4213, The Era of the French Revolution

HIST 4223, France Since 1815

HIST 4243, Germany 1789-1918

HIST 4253, History of Germany 1918-1949

**Humanities**

HUMN 4913, Literary Reflections on the Holocaust

**Music History**

MUHS 3703, History of Music to 1800

MUHS 3713, History of Music from 1800 to Present

MUHS 4253, Special Topics in Music History (depending on topic)

**Philosophy**

PHIL 4033, Modern Phil – 17th and 18th Century

PHIL 4043, 19th Century Philosophy

PHIL 4063, 20th Century Continental Philosophy

PHIL 4073, History of Analytic Philosophy

**Political Science**

PLSC 3553, Western European Politics

PLSC 3963, Modern European Political Thought

PLSC 4543, Government and Politics of Eastern Europe

PLSC 4803, Foreign Policy Analysis

**Requirements for Honors in EUST:** The Honors Program in European Studies gives junior and senior students of high ability the opportunity to enroll in enriched courses and conduct independent research culminating in an honors thesis. In addition to satisfying the general Fulbright College requirements for graduation and the basic eligibility requirements for honors as established by the Honors Council, candidates for honors in European Studies must complete 12 hours of honors credit in partial satisfaction of requirements for the co-major. One to six of these may be thesis hours (EUST 399VH). The preferred method for satisfying the remaining hours is to enroll in the colloquium at least once for honors credit (EUST 4003H) and to take relevant honors colloquia or graduate courses (with permission) in one of the departments contributing to this interdisciplinary area study. The thesis committee



shall include a representative from the major discipline (in the case of multiple majors, from the discipline contributing most significantly to the topic). Successful completion of these requirements will be recognized by the award of the distinction "European Studies Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in exceptional cases and are based upon the whole of the candidate's program of honors studies.

SEE PAGE 287 FOR EUROPEAN STUDIES (EUST) COURSES

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## FOREIGN LANGUAGES (FLAN)

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See also specific languages.

Raymond Eichmann

Chair of Department

425 Kimpel Hall

575-2951

Web Site: <http://www.uark.edu/depts/flaninfo>

- Professors Cory, Eichmann, Hanlin, Haydar, Levine, Pritchett, Ricker, Tucker, Williams
- Professors Emeriti Falke, Fernandez
- Associate Professors Arenberg, Bell, Christiansen, Davis, Fredrick, Restrepo, Turner
- Associate Professors Emeriti Bergal, Ford, Hassel, Horton
- Research Associate Professor Cornell
- Assistant Professors Comfort, Condray, Fukushima, Jones, Ruiz, Summers
- Instructors Rozier, Xu

The foreign language requirement among the basic courses is satisfied by successful completion of a course numbered 2013 for all B.A. degree candidates and of a course numbered 2003 level for all B.S. and B.F.A. degree candidates, and 1013 for B.M. degree candidates. Students who, on the basis of prior knowledge of language, omit one or more courses in the basic language sequence (1013-2013) may receive college credit for omitted courses if they validate their higher placement by passing an advanced course with a grade of "C" or above. Credit will be awarded at the request of the student when filed by application to the foreign language department office.

**Restrictions:** (a) Conversation courses (3033, 4033) and correspondence courses may not be used to validate such prior knowledge, (b) No degree credit (graduation credit) is awarded for a foreign language 1003 course to students in Fulbright College continuing the language begun in high school, either by validation or regular registration. Also, for Fulbright College students who do not present the Fulbright College admission requirement of two units (years) of a single modern foreign or classical language, the first semester of language study will be considered remedial and will not count towards the 124 hours required for graduation (although the course will appear as University credit and the grade received will be computed in the grade-point average). Students transferring from other institutions are expected to meet the same entrance standard.

**Requirement for a Major in a Foreign Language:** (University and College requirements for the Bachelor of Arts are found on pages 44 and 109.)

**FRENCH:** 24 hours in French in courses numbered 3000 or above with a minimum grade of "C" in each course. Specific courses required are FREN 3113, FREN 4003, FREN 4033, FREN 4213, FREN 4223 and FREN 4233.

**GERMAN:** 24 hours in German in courses numbered 3000 or above with a minimum grade of "C" in each course. Specific courses required are GERM 3003, GERM 3013, GERM 4003, GERM 4213,

GERM 4223, three hours of conversation (GERM 3033 or GERM 4033) and six hours of literature.

**SPANISH:** 27 hours in Spanish in courses numbered 3000 or above with a minimum grade of "C" in each course. Specific courses required are SPAN 3003, SPAN 3033, SPAN 3103, SPAN 3113 and SPAN 4003. The remaining 12 hours are to be selected from among other 4000-level offerings, in consultation with the major adviser. Students considering future graduate work in Spanish are strongly advised to take both the Spanish and Latin American literature surveys (SPAN 4103 and 4133).

**Writing Requirement:** The college writing requirement may be satisfied by a term paper or other written work submitted for an upper-division foreign language literature class approved by the chair of the department.

For majors in Greek and Latin, see Classical Studies.

**Requirements for a Minor in Foreign Languages:**

**FRENCH:** 15 hours in courses numbered 3000 or above. Specific courses required are FREN 3113, FREN 4003 and FREN 4033.

**GERMAN:** 15 hours in courses numbered 3000 or above. Specific courses required are GERM 3003, GERM 4003, GERM 4213 and three hours of literature.

**SPANISH:** 15 hours in courses numbered 3000 or above. Specific courses required are SPAN 3003, SPAN 3103 and SPAN 4003 with six additional hours selected in consultation with the Spanish adviser.

**Requirements for a Minor in Foreign Languages with a Business Orientation:**

**FRENCH:** Courses required are FREN 3003, FREN 3103, FREN 4003, FREN 4033 and FREN 4333.

**SPANISH:** Courses required are SPAN 3003, SPAN 3033, SPAN 3103, SPAN 4003 and SPAN 4333.

In some cases, specific course requirements may be adjusted to the individual needs of the candidate with the permission of the Spanish adviser.

For information on advanced degrees in foreign languages, see the *Graduate School Catalog*.

**Requirements for Honors in Foreign Languages:** The Honors Program in Foreign Languages provides an opportunity for upper-division undergraduate students to participate in projects of a scholarly nature. Honors candidates do independent study and research under the direction of the foreign language faculty. Outstanding achievement is recognized by the awarding of the B.A. degree in a specific language or languages with the distinction "Language Scholar *Cum Laude*." Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

In addition to meeting the eligibility standards determined by the Fulbright College Honors Council, candidates must

1. demonstrate an intelligent and responsive command of a minimal number of literary monuments.
2. demonstrate a satisfactory knowledge within the non-literary areas of the target culture,
3. demonstrate an acceptable level of proficiency in the four skills of their language,
4. complete a minimum of six hours of honors work in the chosen language,
5. submit by the final semester of their senior year evidence of substantial independent study,
6. present themselves toward the end of the final semester of their senior year for an oral examination administered by an Honors Council committee.

**Foreign Language (B.A.) Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)

3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.

SEE PAGE 289 FOR FOREIGN LANGUAGES (FLAN) COURSES,  
CHECK PAGE 247 FOR ALPHABETICAL LISTINGS OF SPECIFIC  
LANGUAGES.

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### FULBRIGHT INSTITUTE OF INTERNATIONAL RELATIONS (FIIR)

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Donald R. Kelley  
Director of the Institute  
722 W. Maple  
575-2006  
Web Site: <http://www.uark.edu/~fiir>

The Fulbright Institute of International Relations is a center for study, research, and analysis of foreign policy and international affairs within the J. William Fulbright College of Arts and Sciences. The institute honors J. William Fulbright for his leadership in international relations and his lasting contributions to international education and better understanding among nations. In addition to instructional and research activities, the institute serves as a medium for international scholarly exchange and study programs, and sponsors conferences, seminars, public events, and publications on international relations.

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### GENDER STUDIES (GNST)

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Susan Marren  
Chair of Studies  
333 Kimpel Hall  
575-4301  
Web Site: <http://cavern.uark.edu/depts/h2p/index.html>

- Professors Rushing, Schneider
- Associate Professors Bailey, Coon, Detels, Fredrick, Gordon, Marren, Sonn, Stephens, Swedenburg, Zajicek
- Assistant Professors Amason, Cohen, Cornell (R.), D'Alisera, Erickson, House, Kahf, Parry, Robinson, Starks, Striffler

The Gender Studies minor introduces students to various ways that questions about women's and men's differing participation in work, the family, political systems, and creative endeavors have been asked and answered by different academic disciplines. This is an interdisciplinary minor. Courses in the humanities and the social sciences explore sex roles, sex differences, and the concepts of masculinity and femininity, the roles of women in culture and society, past and present, and their implications for the roles of men, questions about the distribution of power, work, and resources in the public and private sectors, and the symbolic representation of gender and identity in literature, religion, and art. The minor is often chosen by students interested in investigating materials previously neglected by scholars and in fresh perspectives on traditional subject matter. Some expertise in Gender Studies has proven to be an asset to both female and male students who have gone on to a graduate school and to work in such fields as government and business, social services and health agencies, the law, art and politics.

**Program Requirements:** The student must complete 15 credit hours of regular courses listed below or special topics and seminars found in each semester's Schedule of Classes under Gender Studies, including Introduction to Gender Studies (HUMN 2003):

ANTH 3163, Male and Female

ANTH 3523, Gender and Politics in Latin America  
CLST 4003H, Rome on Film  
COMM 3433, Family Communication  
COMM 3983, Rhetoric of American Women  
COMM 4333, Communication and Gender  
ENGL 3913, Women and Modern Literature  
ENGL 398, African American Women's Fiction  
HIST 3083, Women and Christianity  
HIST 3923H, Honors Colloquium, The History of Sexuality in the United States  
HIST 3923H, Honors Colloquium, Russian and Soviet Women  
HIST 4133, Society and Gender in Modern Europe  
HIST 4413, Women and Family in the Middle East Since 1800  
HUMN 2003, Introduction to Gender Studies  
HUMN 3923H, Honors Introduction to Gender Studies  
HUMN 4243, Women in Music and Art  
LAST 4003, Latina Writers  
PLSC 4573, Gender and Politics  
SOCI 4133, The Family  
SOCI 4203, Gender and Society  
WLIT 3983, Women and Arabic Literature

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### GEOSCIENCES (GEOS)

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Thomas O. Graff  
Chair of the Department  
118 Ozark Hall  
575-3159  
Web Site: <http://www.uark.edu/depts/geology/>

- Professors Brahana, Cleaveland, Dixon, Guccione, Hehr, Konig, Manger, Paradise, Stahle, Steele, Zachry
- Associate Professors Boss, Davidson, Davis, Graff, Jansma, Mattioli
- Adjunct Associate Professor Hays
- Research Assistant Professor Nelson

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### Earth Science (ERSC)

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Fulbright College offers a major in earth science leading to the Bachelor of Science degree. Prospective secondary teachers may plan a program, in cooperation with the College of Education, which will satisfy the teacher licensure requirements. Students interested in environmental problems, teaching earth science in public schools, or wishing to pursue graduate work in either geography or geology will obtain much of the necessary foundation through this degree. Because the program outlined below lists only minimum science requirements, it is expected that most students will use some of their elective credit hours to strengthen their science backgrounds in areas other than geography and geology. These areas of additional study will be determined through consultation between the student and the adviser. Students interested in this major should contact either Professor R.H. Konig or Professor J.C. Dixon.

#### Requirements for the B.S. Degree with a Major in Earth Science:

	HOURS
Basic Courses	
Biology	8
Chemistry or Physics	8
GEOL 1113/1111L	4
GEOL 1133/1131L	4
Advanced Courses	
ASTR 2003, ASTR 2001L	4
GEOG 3003, GEOG 4353, GEOG 4363	9
GEOL 2313, GEOL 3114, GEOL 3313, GEOL 3413	13

At least 6 additional hours, at the 3000 level or above,  
in either geography or geology. 6

**Total Hours** 56

In addition, all earth science majors must satisfy the senior-level writing requirement as specified by the geosciences department.

**Earth Science (B.S.) Teacher Licensure in Life/Earth Science or Physical/Earth Science Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for Life/Earth Science, and with the approval of adviser, these courses may be used as electives in student's program of study:  
BIOL 1543/1541L, Principles of Biology  
BIOL 2533/2531L, Cell Biology  
BIOL 3023, Evolutionary Biology  
BIOL 3323/3321L, General Genetics  
BIOL 3863/3861L, General Ecology
6. The following courses are recommended for Physical/Earth Science, and with the approval of adviser, these courses may be used as electives in student's program of study:  
CHEM 1074/1071L, Fundamentals of Chemistry  
CHEM 2262/2272, Analytical Chemistry/Lab  
PHYS 1023/1021L, Physics and Human Affairs  
PHYS 2013/2011L, College Physics
7. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

**Geography (GEOG)**

Undergraduates who wish to major in geography should identify themselves to the department as soon as possible in order that they may develop a meaningful sequence of courses and take part in departmental activities. Two types of undergraduate programs with concentrations in geography are described below. Those interested in the graduate program should consult the *Graduate School Catalog*.

**Requirements for a Major in Geography:** The geography major of 30 hours leads to the B.A. degree in Fulbright College of Arts and Sciences. Requirements include GEOG 1123, GEOG 2103, GEOG 2203, GEOL 1131L, and GEOL 1133. A minimum of 15 hours must be at the 3000 level or above, including GEOG 3023, with a balance between regional and topical courses. The college writing requirement is to be met by completion of a term paper deemed satisfactory by the student's adviser and instructor of an upper-level geography course. The college writing requirement may also be met by the completion of an honors thesis. Students who expect to enter graduate school are encouraged to register for GEOG 410V their senior year. Electives in closely related fields are considered a part of the program and, upon prior approval of the department, six hours may be counted toward the major. Those planning to teach in secondary schools should note that they can both earn their degree in geography and qualify for a teaching certificate, they should consult with the department as early as possible.

**Requirements for a Minor in Geography:** 15 hours in geography to include GEOG 1123. At least 6 hours must be numbered 3000 or above and must include one regional and one topical course.

**Cartography/Remote Sensing GIS Specialization:** This program gives students an opportunity to develop expertise in (1) cartography, map design and computer-assisted map production, (2) remote sensing and image interpretation, including photographic systems, sensor systems, and digital image processing, and (3) geographic information systems, including data sources, analytical techniques, and hardware/software systems.

To complete the specialization, a student is required to fulfill certain course requirements.

Required Courses (9 hours):

GEOG 3023, GEOL 4413, and GEOG 4543 (same as ANTH 4543).

Elective Courses (9 hours to be selected from the following):

GEOG 4523, GEOL 5423, GEOG 4553 (same as ANTH 4553), GEOG 4563 (same as ANTH 4563), GEOG 4573 (same as ANTH 4573), GEOG 4593 (same as ANTH 4593), STAT 4003 (or other approved statistics course)

CVEG 2053 (or other approved surveying course)

CENG 4883

**Requirements for Departmental Honors in Geography:** Admission to the Departmental Honors Program in Geography is open to geography majors with a minimum grade-point average of 3.25 in all their work. All honors candidates must take 12 hours, which may include 6 hours of thesis, in Honors Studies. During the fall semester of either the junior or senior year the candidate will enroll in GEOG 399VH (no more than three hours of credit), an undergraduate seminar in geographical philosophy and methodology. During the senior year the honors candidate will complete the program by writing a senior honors paper under GEOG 399VH (no more than three hours of credit). Successful completion of the requirements will be recognized by the award of the distinction "Geography Scholar *Cum Laude* at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Geography (B.A.) Social Studies Teacher Licensure:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, may be used as electives in student's program of study:  
6 hours of geography, including GEOG 1123, Human Geography  
9 hours of American history, including HIST 2003, HIST 2013  
3 hours of Sociology or Anthropology  
PLSC 2003, American National Government  
PLSC 2203, State and Local Government OR  
PLSC 3223, Arkansas Politics  
PSYC 2003, General Psychology
6. The following courses are specifically required for licensure:  
ECON 2013 or ECON 2023 or ECON 2143  
HIST 3383, Arkansas History
7. Students wanting to teach social studies in middle school should consult with a middle level adviser in the College of Education and Health Professions.

SEE PAGE 289 FOR GEOGRAPHY (GEOG) COURSES



## **Geology (GEOL)**

The department of geosciences offers degrees in several areas of geology including the Bachelor of Science and Bachelor of Arts degrees in geology and the Bachelor of Science degree in earth science. It is emphasized that students wishing to become practicing professional geologists should hold the Bachelor of Science degree in geology at a minimum. It is further recognized that practicing professional geologists typically hold a Master of Science degree. The education of students pursuing the Bachelor of Science in earth science or Bachelor of Arts in geology degrees should reflect general education in the liberal arts with emphasis in geology. The goal of the program leading to the Bachelor of Science degree in geology is to provide students with a broad spectrum of the various subdisciplines of geology, while at the same time honoring an emphasis in the traditional areas of mineralogy, igneous, metamorphic and sedimentary petrology, structural geology and stratigraphic principles. This curriculum will prepare students to enter graduate programs without deficiencies at the University of Arkansas or other established programs.

### **Requirements for a Major in Geology leading to the B.S. Degree:**

A minimum of 40 semester hours including GEOL 1113/1111L (or GEOL 3002), GEOL 2313, GEOL 3313, GEOL 3413, GEOL 3513/3511L, GEOL 4223, GEOL 4643/4641L, GEOL 4666, and 6 additional geology course hours selected from GEOL 4033, GEOL 4043, GEOL 4053, GEOL 4153, GEOL 4253, GEOL 4413, GEOL 4433. Also, each student must complete CHEM 1103/1101L and CHEM 1123/1121L, College or University Physics (8 hours), MATH 2554 and MATH 2564 and a 3-hour upper-level science course approved by the student's adviser.

**Requirements for a Major in Geology leading to the B.A. Degree:** GEOL 1113/1111L (or 3002), GEOL 2313, GEOL 3313, GEOL 3413, GEOL 3513, GEOL 4223, GEOL 4643/4641L and one additional upper-level geology course. Also, each student must complete CHEM 1123/1121L, MATH 2043, and a 3-hour, upper-level science course approved by the student's adviser. All semester hours presented to fulfill the natural science requirements for the B.A. program must be taken in areas other than geology.

**Writing Requirement:** A scholarly writing assignment will be included in all geology courses numbered 2000 and above. Those papers submitted in geology courses 3000 and above will fulfill the Fulbright College writing requirement.

**Requirements for a Minor in Geology:** A minor in geology shall be awarded upon completion of the following course work: GEOL 1113/1111L (or 3002), GEOL 1133/1131L, GEOL 2313, two courses at the 3000-level, and one course at the 4000 level. Students are advised to consult with a geology faculty member to develop the course work program that best complements their major area of study.

**Requirements for Departmental Honors in Geology:** The Departmental Honors Program in Geology provides upper-division undergraduate students with an opportunity to formally participate in geologic research activities. Honors candidates carry out independent study and research under the guidance of the geology faculty. Outstanding student achievement will be recognized by awarding the distinction "Geology Scholar *Cum Laude*" at graduation. Higher degree distinctions may be awarded to truly outstanding students based upon the whole of their academic program and quality of honors research.

Honors candidates in geology must do the following:

1. satisfy departmental and college requirements for a bachelor's degree with honors,
2. become a candidate no later than the second semester of their junior year,
3. enroll in six hours of honors research GEOL 3901, GEOL 3911, GEOL 4922, GEOL 4932,
4. take 12 hours in Honors Studies, which may include 6 hours of thesis,
5. complete junior and senior honors courses GEOL 3901, GEOL

3911, GEOL 4922, GEOL 4932, and

6. achieve a cumulative grade-point average of 3.30 in geology courses.

### **Geology (B.A.) Teacher Licensure in Life/Earth Science or Physical/Earth Science Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for Life/Earth Science, and with the approval of adviser, these courses may be used as electives in student's program of study:  
BIOL 1543/1541L, Principles of Biology  
BIOL 2533/2531L, Cell Biology  
BIOL 3023, Evolutionary Biology  
BIOL 3323/3321L, General Genetics  
BIOL 3863/3861L, General Ecology
6. The following courses are recommended for Physical/Earth Science, and with the approval of adviser, these courses may be used as electives in student's program of study:  
CHEM 1074/1071L, Fundamentals of Chemistry  
CHEM 2262/2272, Analytical Chemistry/Lab  
PHYS 1023/1021L, Physics and Human Affairs  
PHYS 2013/2011L, College Physics
7. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

### **Geology (B.S.) Teacher Licensure in Life/Earth Science or Physical/Earth Science Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for Life/Earth Science, and with the approval of adviser, these courses may be used as electives in student's program of study:  
BIOL 1543/1541L, Principles of Biology  
BIOL 2533/2531L, Cell Biology  
BIOL 3023, Evolutionary Biology  
BIOL 3323/3321L, General Genetics  
BIOL 3863/3861L, General Ecology
6. The following courses are recommended for Physical/Earth Science, and with the approval of adviser, these courses may be used as electives in student's program of study:  
CHEM 1074/1071L, Fundamentals of Chemistry  
CHEM 2262/2272, Analytical Chemistry/Lab  
PHYS 1023/1021L, Physics and Human Affairs  
PHYS 2013/2011L, College Physics
7. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

For requirements for the M.S. degree in geology, see the *Graduate School Catalog*.

SEE PAGE 290 FOR GEOLOGY (GEOL) COURSES



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## HISTORY (HIST)

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Jeannie Whyne

Chair of the Department

416 Old Main

575-3001

Web Site: <http://www.uark.edu/depts/histinfo/history/>

- Distinguished Professors West, Woods
- Alumni Distinguished Professor Emeritus Gatewood
- Professors Bukey, Cornell, Engels, Kennedy, Sutherland, Tsai
- Professors Emeriti Brown, Chase, Vizzier
- Associate Professors Chappell, Coon, Finlay, Gordon, Sloan, Sonn, Tucker, Whyne, Williams (N)
- Associate Professor Emeritus Edwards
- Assistant Professors Brogi, Robinson, Schweiger, Starks, Williams (P)

**Requirements for a Major in History:** 36 semester hours to include WCIV 1003 and WCIV 1013 or HIST 1113 and HIST 1123 (or HIST 1113H and 1123H) and HIST 2003 and HIST 2013, as well as 24 hours in history courses numbered 3000 or above, at least 12 hours of which must be 4000 or above.

Students must select 3 hours from each of the following areas:

**Europe, including Britain and Russia**

HIST 3003, HIST 3063, HIST 3443, HIST 3533, HIST 4003, HIST 4013, HIST 4023, HIST 4043, HIST 4053, HIST 4073, HIST 4083, HIST 4103, HIST 4113, HIST 4133, HIST 4143, HIST 4163, HIST 4183, HIST 4193, HIST 4213, HIST 4223, HIST 4243, HIST 4253, HIST 4283, HIST 4293,

**Africa, Asia, Latin America, Near East, Russia**

HIST 3033, HIST 3043, HIST 3203, HIST 3213, HIST 3233, HIST 3473, HIST 4283, HIST 4293, HIST 4313, HIST 4323, HIST 4353, HIST 4373, HIST 4383, HIST 4393, HIST 4413, HIST 4433,

**United States**

HIST 3263, HIST 3323, HIST 3383, HIST 3583, HIST 3593, HIST 4423, HIST 4463, HIST 4483, HIST 4503, HIST 4513, HIST 4533, HIST 4543, HIST 4563, HIST 4573, HIST 4613, HIST 4623, HIST 4643, HIST 4653, HIST 4663, HIST 4673, HIST 4703, HIST 4723, HIST 4733.

Russia may be counted for only one area. In consultation with an adviser, students who are history majors are encouraged to design a program of study with both breadth and depth.

**Writing Requirement:** To fulfill the Fulbright College writing requirement, each history major will submit, prior to graduation, a substantial research or analytical paper, with a grade of 'A' or 'B' from an upper-division history course (3000, 4000, 5000 level) to his or her departmental adviser. Satisfactory completion of an honors project or a senior thesis may fulfill this requirement.

**Requirements for Departmental Honors in History:** Admission to the Departmental Honors Program in History is open to history majors with a minimum grade-point average of 3.25 in all their work. Prospective Departmental Honors students must take 12 hours in Honors Studies, of which 6 hours must include HIST 3973H, Honors Methods (Spring semester, junior year and HIST 399VH, Honors History Thesis, Fall or Spring semester, senior year). During the senior year, the honors

candidate will complete the program by writing a senior honors thesis. Successful completion of the program will be recognized by the award of the distinction "History Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Requirements for a Minor in History:** 15 semester hours not to include WCIV 1003 and WCIV 1013. A student must notify the department of his or her intent to minor.

For the combined major in history and African-American studies, see page 116.

For freshman history, see Western civilization 1003, 1013.

**History (B.A.) Social Studies Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, may be used as electives in student's program of study:
  - 6 hours of geography, including GEOG 1123, Human Geography
  - 9 hours of American history, including HIST 2003, HIST 2013
  - 3 hours of Sociology or Anthropology
  - PLSC 2003, American National Government
  - PLSC 2203, State and Local Gov. OR
  - PLSC 3223, Arkansas Politics
  - PSYC 2003, General Psychology
6. The following courses are specifically required for licensure:
  - ECON 2013 or ECON 2023 or ECON 2143
  - HIST 3383, Arkansas History
7. Students wanting to teach social studies in middle school should consult with a middle-level adviser in the College of Education and Health Professions.

For requirements for advanced degrees in history, see the *Graduate School Catalog*.

For information regarding departmental scholarships, visit the Web at [www.uark.edu/depts/histinfo/history/sch.html](http://www.uark.edu/depts/histinfo/history/sch.html).

SEE PAGE 295 FOR HISTORY (HIST) COURSES

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## HONORS STUDIES (HNRS)

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Sidney Burris

Director of Honors Studies

517 Old Main

575-2509

Web Site: <http://www.uark.edu/honors>

The J. William Fulbright College of Arts and Sciences is dedicated to providing students a liberal education in the arts, humanities, and sciences. Such an education should be soundly based, innovative, and enriched by a creative faculty. This is especially true for students with superior academic ability or artistic talent. To achieve these aims, the college faculty has developed and participates in the Fulbright College Scholars Program and the Departmental Honors Program.

**Requirements for Departmental Honors:** Specific academic requirements including course work, participation in departmental honors colloquia or seminars, and independent study projects are established by the faculty of the individual departments or study areas and are approved by the Honors Council. However, all departmental honors

students must have a 3.25 cumulative grade-point average, complete and defend an honors thesis, and take 12 hours (which may include six hours of thesis) in Honors Studies. Information concerning these requirements is given within each department's catalog listings.

#### Requirements for the Fulbright College Scholars Program:

Completion of University Core in English composition, including ENGL 1013, ENGL 1023, and ENGL 2003, and in American history or American government, completion of the requirements for departmental honors in a department or study area of the College, a cumulative grade-point average of 3.25 or above, and completion of the honors core curriculum. Students who do not have at least a 3.25 GPA will not be allowed to graduate with Honors.

The following outlines the minimum academic requirements of the honors core curriculum for the B.A., B.S., B.M., and B.F.A. degree programs.

### Honors Core Curriculum

#### Bachelor of Arts Degree

##### Humanities Option 1

	HOURS
World Civilization	6
HIST 1113H, HIST 1123H	
World Literature	6
WLIT 1113H, WLIT 1123H	
Philosophy	3
PHIL 2003H	
Fine Arts	6
Select from the following:	
ARHS 1003H, COMM 1003H, DANC 1003H, DRAM 1003H, HUMN 1003H, MLIT 1003H	
Colloquia in Humanities	6
Must be selected from two different areas of humanities. Course offerings vary each semester. See adviser.	

##### Humanities Option 2

Honors Roots of Culture	16
HUMN 1114H, HUMN 1124H, HUMN 2114H, HUMN 2124H	
Philosophy	3
PHIL 2003H	
Colloquium in Humanities	3
Course offerings vary each semester. See adviser.	

#### Students pursuing either option must also complete the following:

Social Science	3
Select from the following:	
ANTH 1023H, GEOG 2103H, ECON 2013H, ECON 2023H, ECON 2013 AND ECON 2023, PLSC 2003H*, PSYC 2003H, SOCI 2013H	
*PLSC 2003H may not be taken to satisfy both the University Core requirement and the Honors Core Curriculum.	
Colloquia in Social Sciences	6
Must be selected from two different areas of social sciences. Course offerings vary each semester. See adviser.	
Foreign Language: (depending upon placement)	0-12
See your adviser. Students must demonstrate proficiency in a single modern or classical language other than English, usually by completing a sequence of four courses (1003, 1013, 2003, 2013). See Fulbright College Admission Requirements (page 108). Students meeting the normal admission standard (two years of high school language) may expect to satisfy this requirement with fewer courses, depending upon placement. In cases of unusually thorough preparation, or in the case of inter- national students, exemption may be sought from the	

department of foreign languages.	
Natural Science and Mathematics:	12-16
Twelve hours (chosen from at least two different depart- ments) of honors credit, eight of which must be in the laboratory sciences. See adviser for specific science course listing. Additionally, Fulbright Scholars must fulfill the math requirement of MATH 2043 OR MATH 2053 OR MATH 2554. Although not required as honors courses, MATH 2053 or MATH 2554 may, when taken in honors sections, satisfy up to four hours of the re- quired 12 hours of honors credit in the mathematical and natural sciences.	

Colloquium in Natural Science or Math	3
To be selected in an area outside the student's departmental major. Course offerings vary each semester. See adviser.	

#### Bachelor of Science Degree

##### Humanities Option 1

	HOURS
World Civilization	6
HIST 1113H, HIST 1123H	
Fine Arts, World Literature, Philosophy	6
Must be selected from two different areas.	
<i>Fine Arts</i>	
ARHS 1003H, COMM 1003H, DANC 1003H, DRAM 1003H, HUMN 1003H, MLIT 1003H,	
<i>World Literature</i>	
WLIT 1113H, WLIT 1123H	
<i>Philosophy</i>	
PHIL 2003H	
Colloquium in Humanities	3
Course offerings vary each semester. See adviser.	

##### Humanities Option 2

Honors Roots of Culture	12
HUMN 1114H, HUMN 1124H, HUMN 2114H	
Colloquium in Humanities	3
Students pursuing Humanities Option 2 who complete the fourth semester of Honors Roots Culture (HUMN 2124H) will receive a 3 hour waiver for the Humanities Colloquium requirement. Otherwise, they must choose course work from the Humanities colloquia course listing. Course offerings vary each semester. See adviser.	

#### Students pursuing either option must also complete the following:

Social Science	3
Select from the following:	
ANTH 1023H, GEOG 2103H, ECON 2013H, ECON 2023H, ECON 2013 AND ECON 2023, PLSC 2003H*, PSYC 2003H, SOCI 2013H	
*PLSC 2003H may not be taken to satisfy both the University Core requirement and the Honors Core Curriculum.	
Colloquium in Social Sciences	3
Course offerings vary each semester. See adviser.	
Foreign Language: (depending upon placement)	0-9
See your adviser. Students must demonstrate proficien- cy in a single modern or classical language other than English, usually by completing a sequence of three courses (1003, 1013, 2003). Students meeting the nor- mal admission standard (two years of high school language) may expect to satisfy this requirement with fewer courses, depending upon placement. In cases of unusually thorough preparation, or in the case of inter- national students, exemption may be sought from the department of foreign languages.	
Natural Science and Mathematics:	18

Eighteen hours of honors credit to be selected from at least three departments. See adviser for specific science course listing.

Colloquia in Natural Science or Math 6  
Must be selected from two different areas of the natural sciences and mathematics. Course offerings vary each semester. See adviser.

### Bachelor of Music Degree

#### Humanities Option 1

	HOURS
World Civilization	6
HIST 1113H, HIST 1123H	
World Literature	6
WLIT 1113H, WLIT 1123H	
Fine Arts	3
MLIT 1003H	
Colloquium in Humanities	3
Course offerings vary each semester. See adviser.	

#### Humanities Option 2

Honors Roots of Culture	16
HUMN 1114H, HUMN 1124H, HUMN 2114H, HUMN 2124H	
Colloquium in Humanities	
This requirement is fulfilled with the completion of HUMN 2124H.	

#### Students pursuing either option must also complete the following:

Foreign Language: (depending upon placement)	0-6
See your adviser.	
Social Science	3
Select from the following.	
ANTH 1023H, GEOG 2103H, ECON 2013H, ECON 2023H, ECON 2013 AND ECON 2023, PLSC 2003H*, PSYC 2003H, SOCI 2013H	
*PLSC 2003H may not be taken to satisfy both the University Core requirement and the Honors Core Curriculum.	
Natural Sciences:	8
Eight hours of honors credit to be chosen from the lab sciences. See adviser for specific science course listing.	
Mathematics:	3-4
Fulbright Scholars must fulfill the math requirement of MATH 2043 OR MATH 2053 OR MATH 2554.	

### Bachelor of Fine Arts Degree

#### Humanities Option 1

	HOURS
World Civilization	6
HIST 1113H, HIST 1123H	
World Literature	6
WLIT 1113H, WLIT 1123H	
Philosophy	3
PHIL 2003H	
Fine Arts	
Select from the following.	
COMM 1003H, DANC 1003H, DRAM 1003H, HUMN 1003H, MLIT 1003H	
Colloquia in Humanities	6
Must be selected from two different areas of humanities. Course offerings vary each semester. See adviser.	

#### Humanities Option 2

	HOURS
Honors Roots of Culture	16
HUMN 1114H, HUMN 1124H, HUMN 2114H, HUMN 2124H	
Philosophy	3
PHIL 2003H	
Colloquium in Humanities	3
Course offerings vary each semester. See adviser.	
<b>Students pursuing either option must also complete the following:</b>	
Foreign Language: (depending on placement)	0-9
See your adviser.	
Social Science	3
Select from the following.	
ANTH 1023H, GEOG 2103H, ECON 2013H, ECON 2023H, ECON 2013 AND ECON 2023, PLSC 2003H*, PSYC 2003H, SOCI 2013H	
*PLSC 2003H may not be taken to satisfy both the University Core requirement and the Honors Core Curriculum.	
Colloquia in Social Sciences	6
Must be selected from two different areas of social sciences. Course offerings vary each semester. See adviser.	
Natural Science:	8
Eight hours of honors to be chosen from lab sciences. See adviser for specific science course listing.	
Mathematics:	3 - 4
Fulbright Scholars must fulfill the math requirement of MATH 2043 OR MATH 2053 OR MATH 2554.	

### Graduation With Honors

A student who has successfully completed a program of Honors Studies within Fulbright College is eligible to receive a baccalaureate degree with the distinction: Fulbright College Scholar *Cum Laude*, or Departmental Scholar *Cum Laude* in the major field of study. Higher distinctions of *Magna Cum Laude* or *Summa Cum Laude* may be awarded to outstanding honors students by recommendation of the Fulbright College Honors Council.

To earn the distinction Fulbright College Scholar *Cum Laude* at graduation, a student must successfully complete the honors core curriculum, maintain a minimum grade-point average of 3.25, and satisfy requirements for departmental honors in the major field of study, including preparation and oral defense of an honors thesis. The Honors Council may award the higher distinctions of *Magna Cum Laude* or *Summa Cum Laude* based upon a student's total academic performance, including the academic transcript, the quality of the scholarly activity pursued within the major field of study, and the breadth of college study.

To earn the distinction of Departmental Scholar *Cum Laude* at graduation, a student must successfully complete requirements prescribed by the major department, including an honors thesis and oral examination, and maintain a minimum grade-point average of 3.25. If a student demonstrates superior academic performance or an exceptionally high level of scholarly activity, the Honors Council may award the distinction of *Magna Cum Laude*. In those exceptional instances where truly outstanding work within the major field is coupled with a superior understanding of its relationship to the liberal arts, the distinction *Summa Cum Laude* may be awarded.

For more information about Honors Studies within Fulbright College, see individual departmental listings within the college.

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**HUMANITIES (HUMN)**


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Lynda L. Coon  
Chair of Studies  
506 Old Main  
575-6776

Web Site: <http://cavern.uark.edu/depts/h2p/index.html>

- Distinguished Professor West
- Professors Burris, Cochran, Cory, Goodstein, Kennedy, Quinn,
- Adjunct Professor Vitale
- Associate Professors Adams, Coon, Davidson, Detels, Fredrick, Gordon, Jacobs, McCray, Scheide, Sloan, Stephens
- Assistant Professors Halman, Robinson, Sexton
- Adjunct Assistant Professor Del Gesso

The Humanities Program supports interdisciplinary coursework in Gender Studies, Religious Studies, Medieval and Renaissance Studies, Honors World Cultures, and Arts and Aesthetics. Humanities also sponsors courses in Classics, Medieval, and Renaissance cultures taught each semester at the Rome Study Center.

SEE PAGE 299 FOR HUMANITIES (HUMN) COURSES

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**INTERNATIONAL RELATIONS (IREL)**


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Hoyt H. Purvis  
Chair of Studies  
116 Kimpel  
575-3601

The J. William Fulbright College of Arts and Sciences is strongly committed to the study of international relations and this program offers students a strong foundation for more advanced study as well as preparation for careers in an increasingly global economy and society. The degree offers a broad interdisciplinary course of study with a strong intercultural and international focus. Intensive language study and study abroad are especially encouraged.

**Requirements for a Major in International Relations:**

	HOURS
FIIR 2813, Introduction to International Relations (same as PLSC 2813)	3
Six hours of upper-division Foreign Language courses or equivalent. (May be satisfied with approved study abroad courses related to language field. If upper-division language courses or unavailable in field of study, appropriate courses will be approved as substitutes.)	6
ECON 2013 (Principles of Macroeconomics) and ECON 2023 (Principles of Microeconomics), or ECON 2143 (Basic Economics), and one upper-level international economics course: ECON 4633 ( International Trade Policy) or ECON 4643 (International Monetary Policy)	6-9
From the following (depending on ECON option selected): (Courses must be selected from at least two departments.)	6-9
COMM 4343 Intercultural Communication	
ECON 4633 International Trade Policy or ECON 4643 International Monetary Policy * if not used to meet ECON requirement	
GEOG 2103 Emerging Nations	
GEOG 2203 Developed Nations	
GEOG 4243 Political Geography	
HIST 3063 Military History	
HIST 3443 Modern Imperialism	
HIST 3533 World War II	

- HIST 3583 U.S. and Vietnam
- HIST 4483 Diplomatic History
- PLSC 3533 Political Development
- PLSC 3803 International Organization
- PLSC 3813 International Law
- PLSC 3823 Theories of International Relations
- PLSC 3853 American Foreign Policy
- PLSC 4513 Creating Democracies
- PLSC 4803 Foreign Policy Analysis
- PLSC 4813 Politics of the Cold War

**Area Studies Concentration**

Three hours of an Area Studies Colloquium (AIST, EUST, LAST, MEST, or RSST 4003) and approved area studies courses from GEOG, HIST, or PLSC. (A second Area Studies Colloquium may be taken with advanced approval.)

FIIR (IREL) 4003 (International Relations Seminar) 3  
(Credits in study-abroad courses on an international topic or an honors colloquium on an international topic may be applied toward the major if approved in advance. Such courses may not be substituted for FIIR/PLSC 2813, the ECON requirement, or FIIR 4003.)

**Disciplinary or Area Studies Minor**

Students must complete a minor (15-18 hours) in one of these disciplines, consisting of approved international-related courses:

- Anthropology (15)
- Economics (18)
- Geography (15)
- History (15)
- Political Science (18)
- Asian Studies (15)
- European Studies (15)
- Latin American Studies (15 and language requirements)
- Middle East Studies (18)
- Russian Studies (18)

**Approved Courses for Minor in Anthropology for International Relations majors:**

- ANTH 3003 World Prehistory
- ANTH 3123 Anthropology of Religion
- ANTH 3233 Prehistoric Peoples and Cultures of Mexico and Central America
- ANTH 3503 Power and Popular Protest in Latin America
- ANTH 3523 Gender and Politics in Latin America
- ANTH 3923H Honors Colloquium (for honors students if the topic is international-related)
- ANTH 4023 Egyptology
- ANTH 4123 Ancient Middle East
- ANTH 4163 Globalization: Crisis, Conflict and Capitalist Development
- ANTH 4253 Peoples and Cultures of World Regions
- ANTH 4513 African Religions: Gods, Witches, Ancestors
- ANTH 4533 Middle East Culture
- ANTH 4583 Peoples and Cultures of Sub-Saharan Africa

**Approved Courses for Minor in Economics for International Relations majors:**

- ECON 2013 Principles of Macroeconomics and ECON 2023 Principles of Microeconomics or ECON 2143\* Basic Economics
- ECON 3033 Microeconomic Theory
- ECON 3133 Macroeconomic Theory
- ECON 4633 International Trade Policy
- ECON 4643 International Monetary Policy

\* Students who take ECON 2143 will be required to take an additional upper division economics course to complete the minor



**Approved Courses for Minor in Geography for International Relations majors:**

GEOG 2023 Economic Geography  
 GEOG 2103 Emerging Nations  
 GEOG 2103H Honors Emerging Nations  
 GEOG 2203 Developed Nations  
 GEOG 3353 Economic Geography of NAFTA  
 GEOG 3923H Honors Colloquium  
 (for honors students if the topic is international-related)  
 GEOG 4013 Latin America  
 GEOG 4033 Geography of the Middle East  
 GEOG 4243 Political Geography  
 GEOG 4723 Australia and the Pacific Islands  
 GEOG 4783 Geography of Europe  
 GEOG 4793 Geographic Concepts for Global Studies

**Approved courses for minor in History for International Relations majors:**

HIST 1113 Institutions and Ideas of World Civilization  
 HIST 1113H Honors World Civilization  
 HIST 1123 Institutions and Ideas of World Civilization  
 HIST 1123H Honors World Civilization  
 HIST 3003 History of Christianity  
 HIST 3033 Islamic Civilization  
 HIST 3043 History of the Modern Middle East  
 HIST 3063 Military History  
 HIST 3203 Colonial Latin America  
 HIST 3213 Modern Latin America  
 HIST 3443 Modern Imperialism  
 HIST 3473 Palestine and Israel in Modern Times  
 HIST 3503 Far East in Modern Times  
 HIST 3533 World War II  
 HIST 3583 The United States and Vietnam, 1945-1975  
 HIST 3923H Honors Colloquium  
 (for honors students if the topic is international-related)  
 HIST 4003 Greece and the Ancient Near East  
 HIST 4013 Alexander the Great and the Hellenistic World  
 HIST 4023 The Roman Republic and Empire  
 HIST 4043 Late Antiquity and the Early Middle Ages  
 HIST 4053 Late Middle Ages  
 HIST 4073 Renaissance and Reformation, 1300-1600  
 HIST 4083 Early Modern Europe, 1600-1800  
 HIST 4103 Europe in the 19<sup>th</sup> Century  
 HIST 4113 Twentieth Century Europe, 1898-1939  
 HIST 4133 Society and Gender in Modern Europe  
 HIST 4143 Intellectual History of Europe  
 Since the Enlightenment  
 HIST 4163 Tudor-Stuart England  
 HIST 4193 Great Britain, 1901-1982: Empire to Welfare State  
 HIST 4213 The Era of the French Revolution  
 HIST 4223 France Since 1815  
 HIST 4243 Germany, 1789-1918  
 HIST 4253 History of Germany, 1918-1949  
 HIST 4283 Russia to 1861  
 HIST 4293 Russia Since 1861  
 HIST 4313 History of China to 1644  
 HIST 4323 Modern China  
 HIST 4343 Modern Japan  
 HIST 4353 Middle East 600-1500  
 HIST 4373 Mongol & Mamluk Middle East 1250-1520  
 HIST 4383 The History of Sub-Saharan Africa  
 HIST 4393 The Ottoman Empire and Iran 1300-1722  
 HIST 4413 Women and Family in the Middle East Since 1800  
 HIST 4423 The Mediterranean World

HIST 4433 Social and Cultural History  
 of the Modern Middle East  
 HIST 4463 The American Frontier  
 HIST 4473 Environmental History  
 HIST 4483 Diplomatic History of U.S. 1890 to 1960

**Approved courses for Minor in Political Science for International Relations majors:**

18 hours including PLSC 2003 or PLSC 2013. At least nine of these hours must be in courses numbered 3000 or above, and courses must be chosen from at least two of the five Political Science fields.

PLSC 2813 Introduction to International Relations  
 PLSC 3503 Government and Politics of East Asia  
 PLSC 3523 Government and Politics of the Middle East  
 PLSC 3533 Political Development  
 PLSC 3553 West European Politics  
 PLSC 3573 Government and Politics of Latin America  
 PLSC 3803 International Organization  
 PLSC 3813 International Law  
 PLSC 3823 Theories of International Relations  
 PLSC 3853 American Foreign Policy  
 PLSC 4503 African Politics  
 PLSC 4513 Creating Democracies  
 PLSC 4543 Government and Politics of Eastern Europe  
 PLSC 4563 Government and Politics of Russia  
 PLSC 4583 Political Economy of the Middle East  
 PLSC 4593 Islam and Politics  
 PLSC 4803 Foreign Policy Analysis  
 PLSC 4813 Politics of the Cold War  
 PLSC 4823 Foreign Policy of East Asia  
 PLSC 4843 Middle East in World Affairs  
 PLSC 4873 Inter-American Politics

**Approved Courses for Minor in Asian Studies**

Students must complete 15 credit hours of courses from the list of approved Asian Studies courses in the Catalog, including at least three hours in the Asian Studies Colloquium (AIST 4003).

**Approved Courses for Minor in European Studies**

Students must fulfill the Colloquium (EUST 4003) and language requirements for European Studies minors described in the Catalog of and must complete 12 hours from the list of approved European Studies courses in the Catalog, including at least three hours in the European Studies Colloquium (EUST 4003).

**Approved Courses for Minor in Latin American Studies**

Students must fulfill the Colloquium (LAST 4003) and language requirements for Latin American Studies minors described in the Catalog and must complete 12 hours from the list of approved Latin American studies courses listed in the Catalog.

**Approved Courses for Minor in Middle East Studies**

Students must complete a minimum of 9 hours of approved MEST core courses, 3 hours in the MEST Colloquium (MEST) 4003, and 6 hours of Arabic beyond the 12 credit College language requirement.

**Approved Courses for Minor in Russian Studies**

Students must fulfill the Colloquium (RSST 4003) and language requirements for Russian Studies described in the catalog and must complete 12 hours from approved Russian Studies courses listed in the catalog.

## JOURNALISM (JOUR)

### WALTER J. LEMKE DEPARTMENT OF JOURNALISM

Patsy G. Watkins  
Chair of the Department  
116 Kimpel Hall  
575-3601  
Web Site: <http://uark.edu/journalism>

- Professor Purvis
- Professors Emeriti Ingenthron, Reed
- Associate Professors Carpenter, Foley, Jordan, Miller, Montgomery, Stockdell, Watkins, Wicks
- Instructors Martin, Shurlds
- Instructor Emerita Belzung

The purpose of the department is to provide students with knowledge of the history, theory, and ethics of mass communications, to educate students in journalistic skills, including the ability to express themselves logically and clearly, and to guide them in securing specialized knowledge of society appropriate to journalistic careers.

Journalism majors must fulfill the requirements for either the news/editorial option, the advertising/public relations option or the broadcast option. A minimum of 84-85 hours in non-journalism courses must be applied toward the 124 hours required by the college for a Bachelor of Arts degree.

**Writing Requirement:** Students may meet the college writing requirement by producing a satisfactory honors thesis, or research/analytical paper. The research/analytical paper may be written in any journalism course numbered JOUR 3133 or higher or by registering for JOUR 498V. Rules governing the research/analytical paper may be obtained from the journalism department or from any journalism professor.

**Requirements for a Journalism Degree:** A minimum of 33 semester hours in journalism, including JOUR 1023, JOUR 1033 and JOUR 3633. Note that a minimum grade of 'C' is required in all journalism courses that serve as prerequisites for advanced journalism courses. In certain courses a minimum grade of 'B' is required. Also required is ENGL 2013. Students must select a sequence when they enter the department. Specific courses in addition to the journalism courses are required only for the advertising/public relations sequence. The requirements for each sequence are as follows:

**News/Editorial:** JOUR 2013, JOUR 3013, JOUR 3123, and either JOUR 3023 or JOUR 4553 are required, plus any four additional journalism courses for which the student has prerequisites, it is recommended that one course choice be an internship.

**Advertising/Public Relations:** JOUR 3723, JOUR 3743, JOUR 4143, JOUR 4423, and JOUR 4453 are required, plus any three additional journalism courses for which the student has prerequisites, it is recommended that one course choice be an internship. Also required are ECON 2143, MKTT 3433 and MKTT 4553. Ad/PR option students are required to earn a grade of 'B' in both JOUR 3723 and JOUR 3743 to qualify to take all upper level Ad/PR sequence courses.

**Broadcast:** JOUR 2032/2031L, JOUR 3072/3071L, JOUR 4863/4860L and JOUR 4873 are required, plus any four additional journalism courses for which the student has prerequisites, it is recommended that one course choice be an internship and another choice be JOUR 4883/4880L.

**Requirements for Departmental Honors in Journalism:** The Journalism Honors Program gives upper-division undergraduates a chance to pursue journalistic research in the context of other academic disciplines. Honors candidates carry out independent study and research under the guidance of the journalism faculty and participate in honors

classes in journalism and at least one other discipline. Outstanding student achievement will be recognized by the award of distinction "Journalism Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in cases of exceptional achievement and are based on the candidate's total honors studies program. To be considered for such distinctions, students must earn a minimum cumulative 3.50 grade-point average in journalism.

Journalism departmental honors students must satisfy the general Fulbright College honors requirements as stated elsewhere in this catalog. In addition, for journalism departmental honors, they must complete a minimum of 12 hours in honors credits, with thesis credit determined by departmental rules. These requirements are specified as follows:

Journalism departmental honors students must . . .

1. enter the program no later than the first semester of their junior year, and register for thesis beginning with the first semester of the junior year,
2. complete at least one journalism honors colloquium,
3. complete the journalism honors core research course JOUR 5043,
4. complete an approved honors colloquium in a second discipline,
5. complete and orally defend an honors thesis based on honors courses of study, and
6. earn a cumulative 3.50 grade-point average in journalism courses.

Four-Year Honors students who would like to major in journalism must meet all requirements for Journalism Department Honors.

More specific information on the Journalism Departmental Honors program, including the requirements for Four-Year Honors students, is available in the Journalism Department Honors handbook.

**Combined Majors:** Combined Major in Journalism and Political Science: The combined major in journalism and political science is recommended for those students who have a strong interest in the reporting of public affairs as a career. The journalism requirement may be satisfied by 24 semester hours of courses, including JOUR 1023, JOUR 2013, JOUR 3013, JOUR 3023, JOUR 3633, and JOUR 4043, plus two courses from the following: JOUR 3133, JOUR 3333. (Some courses may have prerequisites.)

The political science requirement may be satisfied by 24 semester hours of courses, including PLSC 2003, PLSC 2013, PLSC 4373, and 15 additional hours of advanced political science courses elected from one or the other of two field concentrations. Those wishing to emphasize American political affairs may elect the additional hours from the following:

PLSC 3103	PLSC 3113	PLSC 3153	PLSC 3183
PLSC 3203	PLSC 3223	PLSC 3243	PLSC 3253
PLSC 3603	PLSC 3853	PLSC 3923H	PLSC 3913
PLSC 3933	PLSC 394V	PLSC 3973	PLSC 3983
PLSC 399VH	PLSC 4193	PLSC 4203	PLSC 4213
PLSC 4223	PLSC 4243	PLSC 4253	PLSC 4263
PLSC 4273	PLSC 4813	PLSC 4823	PLSC 4903

Alternatively, a foreign affairs concentration may be pursued by electing the advanced hours from the following courses:

PLSC 3503	PLSC 3523	PLSC 3533	PLSC 3553
PLSC 3573	PLSC 3603	PLSC 3803	PLSC 3813
PLSC 3823	PLSC 3853	PLSC 3923H	PLSC 394V
PLSC 3953	PLSC 3963	PLSC 3973	PLSC 3983
PLSC 399VH	PLSC 4273	PLSC 4503	PLSC 4513
PLSC 4543	PLSC 4563	PLSC 4573	PLSC 4583
PLSC 4593	PLSC 4803	PLSC 4843	PLSC 4873

**Combined Major in Journalism and English:** The combined major in journalism and English is recommended for those students who have a strong interest in these two related fields. The journalism requirement for the combined major is as follows: 21 semester hours including JOUR 1023, JOUR 1033, JOUR 2013, JOUR 3013, JOUR 3023, and JOUR 3633. (Some courses may have prerequisites.) For English course

requirements for the combined major see notes under department of English.

**Journalism (B.A.) Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.

**NOTE:** The journalism courses required are currently being developed. Contact your departmental adviser.

**Journalism for Agricultural Majors:** A list of 18 hours of journalism courses is available for students in the College of Agricultural, Food and Life Sciences. See the Bumpers College section of this catalog for these journalism courses. This program is recommended for students who plan to work in public relations in these areas. It is also recommended for students who expect to enter extension work in agriculture and home economics and who will use the mass media to promote their programs.

SEE PAGE 303 FOR JOURNALISM (JOUR) COURSES

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**LATIN AMERICAN STUDIES (LAST)**

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Steven M. Bell  
Chair of Studies  
605 Kimpel Hall  
575-2951

Web Site: <http://www.uark.edu/depts/lastinfo>

- Professors Britton, Méndez (economics), Graff, Hehr (geography), Pritchett (foreign languages), Purvis (journalism and political science), Williams (English)
- Associate Professors Bell, Restrepo (foreign languages), Montgomery (journalism), Ryan (political science)
- Assistant Professors Ruiz, Summers (foreign languages), Erickson, Striffler (anthropology)

Students interested in Latin America and wishing to maximize their potential for academic, business, professional, or government careers related to the area, may earn a combined major or a minor in Latin American Studies together with a major in another discipline in Fulbright College. Advice on appropriate combinations of Latin American Studies with other majors as well as individual approval of such combinations may be obtained from the LAST program director. New students in this program must officially declare the combined major and notify the LAST program director. Degree checks must also be cleared with the program director. Freshmen and sophomores considering this program are advised to begin their study of Spanish or Portuguese as early as possible.

**Requirements for a minor in Latin American Studies:** Students wishing to minor in Latin American Studies must fulfill the Colloquium (LAST 4003) and the language requirements described below, and must complete at least 12 hours from among the electives listed below. Included in the 12 hours may be 3 additional hours of LAST 4003, provided the topic is different. A maximum of 6 hours of electives may be submitted from any one department.

**Requirements for a major in Latin American Studies:** Language Competence: The student must complete SPAN 2013 (or equivalent) or PORT 2013 (or equivalent). Provisions are available for recognition of language skills gained by other means than formal course work taken at the University of Arkansas: See information under the entry in the

department of foreign languages. Further functional work in Spanish or Portuguese as well as study and residence in a Latin American nation can serve to strengthen language competence and are encouraged.

**Colloquium:** The student must complete at least three hours in the interdepartmental colloquium, LAST 4003. The Colloquium may be repeated, with the adviser's approval, provided the topic is different.

**Electives:** The student must complete 18 hours, in addition to the LAST Colloquium, in courses with specific Latin American content, or individualized study options under instructors teaching Latin American studies. Students choosing to take individualized readings or directed research courses must obtain the approval of the director of the area studies program. In the selection of the electives, the following conditions apply:

1. courses must be selected from at least three different departments,
2. a maximum of nine hours may be submitted from courses taken in any one department.

The following courses and individualized study options may be taken in fulfillment of elective requirements (for detailed descriptions please see the listings under the individual departmental headings):

Anthropology

- ANTH 3233, Prehistoric Peoples/Cultures of Mexico and Central America
- ANTH 3503, Power and Popular Protest in Latin America
- ANTH 3513, Latinos in the US
- ANTH 3523, Gender and Politics in Latin America
- ANTH 4173, The Latin American City
- ANTH 448V, Individual Studies in Anthropology

Economics

- ECON 3843, Economic Development

Geography

- GEOG 2103, Emerging Nations
- GEOG 4013, Latin America
- GEOG 410V, Special Problems in Geography
- GEOG 4173, The Latin American City

History

- HIST 3203, Colonial Latin America
- HIST 3213, Modern Latin America
- HIST 4173, The Latin American City
- HIST 4743, History of Brazil

Latin American Studies

- LAST 2013, Introduction to Latin-American Studies
- LAST 3013, Modern Latin American Lit in Translation
- LAST 4003, Latin-American Studies Colloquium
- LAST 4173, The Latin American City

Political Science

- PLSC 3573, Governments and Politics of Latin America
- PLSC 394V, Readings in Political Science
- PLSC 4873, Inter-American Politics
- PLSC 5573, Political Change/Latin America

Spanish

- SPAN 3103, Cultural Readings
- SPAN 3113, Intro to Literature
- SPAN 4133, Survey of Spanish-American Literature
- SPAN 4223, Latin-American Civilization
- SPAN 4233, Modern Mexico: Culture and Society
- SPAN 4243, Literature and Culture in the Hispanic United States
- SPAN 4253, Latin-American Cinema and Society
- SPAN 475V, Special Investigations
- SPAN 5253, Colonial Literature and Culture
- SPAN 5393, 19th Century Spanish-American Literature
- SPAN 5463, 20th Century Spanish-American Literature
- SPAN 5533, Mexican Literature

SEE PAGE 306 FOR LATIN AMERICAN STUDIES (LAST) COURSES



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**MATHEMATICAL SCIENCES (MASC)**


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Dmitry Khavinson  
 Chair of the Department  
 301 SCEN  
 575-3351

- Distinguished Professor Schein
- Professors Emeritus Duncan, Dunn, Keown, Kimura, Long, Scroggs, Summers
- Professors Akeroyd, Brewer, Cochran, Feldman, Khavinson, Luecking, Madison
- Associate Professors Emeritus Monroe, Sekiguchi
- Associate Professors Arnold, Goodman-Strauss, Johnson, Meaux, Meek, Ryan
- Assistant Professors Capogna, Chan, Hogan, Lanzani, De Oliveira, Petrus, Rieck, Woodland
- Visiting Assistant Professors Solynin, Vassilev (D), Vassilev (J)

**Requirements for a Major in Mathematics, B.A. Degree:** MATH 2103, MATH 2574, MATH 4932 and 18 semester hours of courses in mathematics numbered above 3000, including MATH 3083 and MATH 3113. (See writing requirement below.)

**Requirements for a Major in Mathematics, B.S. Degree:** As a part of the requirements for a B.S. degree with a major in mathematics, the student must complete MATH 2103, MATH 2574, MATH 3083, MATH 3113, MATH 3404, MATH 4513, MATH 4932, and CSCE 1023/1021L or CENG 1113/1111L. In addition, for the B.S. degree in mathematics, the student is required to complete one of the following three options:

1. a program for the student who wishes to prepare for either industrial work in mathematics or graduate work in some field other than mathematics or statistics,
2. a program for the student who is seeking a broad background in mathematics or who wishes to study mathematics at the graduate level,
3. a program for the student who wishes to emphasize statistics or who intends to study statistics at the graduate level.

The courses required for option (1) are MATH 3423, either MATH 4353 and MATH 4363 or STAT 3013 and STAT 4003, plus three semester hours of electives from mathematics courses numbered above 3000. Strongly recommended electives in this program are MATH 4523 and MATH 3443.

The courses required for option (2) are MATH 4523, MATH 3443, MATH 4113 and three hours of electives from mathematics courses numbered above 3000.

The courses required for option (3) are MATH 3353, STAT 3013, STAT 4003, STAT 4001L, STAT 4033, STAT 4043. Strongly recommended electives in this program are STAT 5103 and STAT 5113.

All of the electives used in fulfilling the requirements for either of the baccalaureate programs in mathematics must be approved by the student's adviser.

The science requirement for the Bachelor of Science degree in mathematics consists of two of the five course sequences as listed:

1. BIOL 1543/1541L and one of BIOL 2533, BOTY 1613/1611L, ZOOL 1613/1611L or MBIO 2013/2011L
2. CENG 1123/1121L and CSCE 2143
3. CHEM 1103/1101L, CHEM 1123/1121L
4. GEOL 1113/1111L, GEOL 1133/1131L
5. PHYS 2054, PHYS 2074 (College Physics will not substitute)

In addition, one advanced course must be chosen from one of the two chosen areas. Courses taken to satisfy this requirement must be approved by the department of mathematical sciences.

A 2.00 cumulative grade-point average on all work completed in the

department of mathematical sciences will be required for graduation with a B.A. or B.S. degree.

**Writing Requirement for both B.A. and B.S. Degrees:** The writing requirement for mathematics majors will be satisfied by writing a paper based on the student's research of a mathematical topic under the direction of a faculty member. Typically, one hour of credit in MATH 400V will be awarded for successfully completing the paper. An honors paper or senior thesis will satisfy this requirement. The student should consult his or her adviser for details.

**Requirements for Departmental Honors in Mathematics:** The Departmental Honors Program in Mathematics is designed for the superior student and is intended to help the student develop a more comprehensive view of the nature of mathematics. The program provides a vehicle for the recognition of the achievements of work beyond the usual course of study and earns the student the distinction "Mathematics Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Graduation with honors:** The candidate must satisfy the requirements set forth by the Honors Council. The candidate must also obtain at least a 3.50 grade-point average in mathematics courses numbered MATH 2554, MATH 2564, MATH 2574, MATH 3083, MATH 3113, MATH 3404, and MATH 4513, as well as in the additional mathematics courses necessary to complete the requirements for the chosen option. In addition, a grade of "D" or "F" in any other course offered by the Department disqualifies a student for honors.

Candidates must take one year of honors mathematics in their senior year. This course will require an acceptable paper and will carry two hours of credit per semester. The quality of this paper, along with the execution of the rest of the student's honors program including the overall academic performance, will be used in determining the distinction between Honors and High Honors.

**Requirements for a Minor in Mathematics:** MATH 2103, 2564, and 9 hours (3 courses) selected from MATH 2574, MATH 3083, MATH 3103, MATH 3113, MATH 3404, and MATH 4513.

**Requirements for a Minor in Statistics:** MATH 2554 and 12 hours of non-cross-listed courses in the statistics section of this catalog, including 9 hours in courses numbered 3000 and above. A student must notify the department of his or her intent to minor.

Students in Fulbright College of Arts and Sciences who, in the opinion of the department of mathematical sciences, need additional work in the fundamentals are required to take MATH 0003. Using the student's record and their ACT or Mathematics Placement Test scores, a student's adviser will suggest enrollment in appropriate courses.

**Mathematics (B.A. or B.S.) Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. Students wanting to teach mathematics in middle school should consult with a middle level adviser in the College of Education and Health Professions.

SEE PAGE 307 FOR MATHEMATICS (MATH) COURSES



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## MEDICAL SCIENCES AND DENTISTRY

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See page 113, under Combined Academic and Medical or Dental Degree, and also the discussion of the pre-medical programs and the pre-dental program under the section on Health Related Professions.

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## MEDIEVAL AND RENAISSANCE STUDIES (MRST)

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William Quinn  
Chair of Studies  
Kimpel Hall 333  
575-4301

Web Site: <http://cavern.uark.edu/depts/h2p/index.html>

- Professors Candido, Cornell (V.), Cory, Detels, Goodstein, Gross, Levine, Quinn, Spellman, Tsai, Waligorski
- Associate Professors Coon, Finlay, Fredrick, Horton, Jacobs, Stephens, Tucker
- Assistant Professors Cornell (R.), Sexton

The MRST minor is administered by the Humanities program. This minor encourages undergraduate students to pursue an interdisciplinary study of all aspects of the Middle Ages and Renaissance as a complement to their major field of study.

**Requirements for a minor in Medieval and Renaissance Studies (MRST):** (15 credit hours). Students must take HIST 1113H/HIST 1113 (World Civ I Honors or non honors) or HUMN 1124H/1120E (the medieval segment of the Honors Humanities Project) and complete at least 12 additional credit hours selected from the courses listed below. A maximum of 6 hours may be presented from courses taken in the student's designated major.

Required Core Course (3 hours)

HUMN 1124H Honors Equilibrium of Cultures, 500-1600 CE and discussion section, HUMN 1120E or HIST 1113H, Honors World Civilization I (may also be taken as non honors, HIST 1113, World Civilization I)

12 hours of electives to be chosen from the following (a maximum of six hours may be presented from courses taken in the student's major department):

ARHS 4843, Medieval Art  
ARHS 4853, Italian Renaissance Art  
ARHS 4863, Northern Renaissance Art  
ARCH 2233, History of Architecture I  
ARCH 4023, Adv Architectural Studies  
DRAM 4773, Acting Shakespeare  
ENGL 3433, Intro to Chaucer  
ENGL 3613, Elizabethan and Jacobean Literature  
ENGL 3653, Intro to Shakespeare  
LATN 5633, Medieval Latin  
SPAN 5203, Medieval Spanish Lit  
HIST 3033, Islamic Civilization  
HIST 4043, Late Antiquity and the Early Middle Ages  
HIST 4053, Late Middle Ages  
HIST 4073, Renaissance and Reformation, 1300-1600  
HIST 4163, Tudor-Stuart England  
HIST 4313, China to 1644  
HIST 4353, Middle East, 600-1500  
HIST 4373, Mongol and Mamluk Middle East, 1250-1520  
HIST 4393, Ottoman Empire and Iran (1300-1722)  
HUMN 3923H, Honors Colloquium  
(when offered as a MRST course)  
HUMN 425V, Special Topics Colloquium  
(when offered as a MRST course)  
MUHS 3703, History of Music to 1800

PHIL 4013, Platonism and the Origin of Christian Theology  
PHIL 4023, Medieval Philosophy  
PLSC 3953, Ancient and Medieval Political Thought

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## MICROBIOLOGY (MBIO)

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SEE PAGE 308 FOR MICROBIOLOGY (MBIO) COURSES

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## MIDDLE EAST STUDIES (MEST)

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Vincent J. Cornell  
Director, King Fahd Center for Middle East and Islamic Studies  
202 Old Main  
575-4157

- Professors Cornell (V.) (history), Farah (curriculum and instruction), Haydar (foreign languages), Paradise (geography), Rose (anthropology)
- Associate Professors Adler (philosophy, biblical Hebrew), Coon (history), Gordon (history), Kahf (comparative literature), Reid (political science), Swedenburg (anthropology), Tucker (history), Wolpert (music)
- Assistant Professors D'Alisera (anthropology), Ghabdian (political science)
- Research Associate Professor Cornell (R.) (Arabic)
- Research Assistant Professor Halman (Middle East studies, religious studies)

Students interested in the Middle East, and wishing to maximize their potential for academic, business, professional, or government careers related to the area, may earn a major in Middle East Studies with a required second major in an approved area such as anthropology, economics, foreign languages, geography, history, journalism, and political science. New students entering the program are required to notify both the major adviser and the MEST director of their intention to participate. Freshmen and sophomores considering this program are advised to begin their study of a Middle East language as early as possible. Students may also earn a minor in Middle East Studies.

**Requirements for a Major in MEST:** To attain a major in MEST, the student is required to have a second major in an approved area such as anthropology, history, international relations, political science, geography, foreign languages, comparative literature, journalism, or economics. Up to nine hours of courses in the second major with Middle East content may be counted toward the MEST major with the permission of the MEST director.

**Total Hours Required:** (30 semester hours) Students must complete 21 hours in MEST or MEST-approved courses, 3 hours in the MEST Colloquium (MEST 4003), and 6 hours of Arabic language beyond the Fulbright College language proficiency requirement (ARAB 2013). MEST courses must be in at least two disciplines, with no fewer than 9 hours of MEST core courses in each.

**Arabic Requirement:** (6 hours of MEST credit) Students must complete 6 hours of Arabic language beyond the Fulbright College language proficiency requirement (ARAB 2013). Courses approved by the MEST director and completed in a summer intensive Arabic program or study-abroad program in an Arabic speaking country may substitute for all or part of this requirement.

**Middle East Studies Colloquium:** (3 hrs.) Students must complete at least 3 hours in the Middle East Studies Colloquium (MEST 4003). The Colloquium may be repeated with a change of subject for a maximum of 6 credits.

**Electives:** (up to 9 hours) To count for MEST credit, courses not on the following list must be approved by the student's MEST major advis-

er and the MEST director. Individualized readings, directed research courses, or courses in a second Middle Eastern language such as biblical Hebrew or Aramaic may count as electives. To count for MEST core credit, Arabic courses must be on literary topics. MEST Core Courses:

ANTH 3123 Anthropology of Religion  
 ANTH 4023 Seminar in Egyptology  
 ANTH 4123 Ancient Middle East  
 ANTH 4253 Peoples and Cultures of World Regions  
 ANTH 4256 Archeological Field Session  
 ANTH 4533 Middle East Cultures  
 ANTH 4803 Historical Archeology  
 ANTH 4913 Topics in the Middle East  
 ARAB 4213 Introduction to Arab Culture  
 ECON 4533 Comparative Economic Systems  
 GEOG 2103 Emerging Nations  
 GEOG 4033 Geography of the Middle East  
 HIST 3033 Islamic Civilization  
 HIST 3043 History of the Modern Middle East  
 HIST 3473 Palestine and Israel in Modern Times  
 HIST 4353 Middle East 600-1500  
 HIST 4373 Mongol and Mamluk 1250-1520  
 HIST 4393 The Ottoman Empire and Iran 1300-1722  
 HIST 4413 Women and Family in the Middle East Since 1800  
 HIST 4433 Social/Cultural History of the Modern Middle East  
 HIST 4483 Diplomatic History of U.S. 1890 to 1960  
 MEST 4003 Middle East Studies Colloquium  
 MEST 4003 H Honors Middle East Studies Colloquium  
 PLSC 3523 Politics of the Middle East  
 PLSC 4583 Political Economy of the Middle East  
 PLSC 4593 Islam and Politics  
 PLSC 4843 The Middle East in World Affairs  
 WLIT 3983/603 Special Studies: Modern Arabic Poetry  
 WLIT 3983/603 Special Studies: Modern Arabic Literature  
 in Translation  
 WLIT 3983/603 Special Studies: Women and Arabic Literature

**Requirements for a Minor in Middle East Studies:**

Total Hours Required: (18 semester hours)

Students must complete a minimum of 9 hours of MEST courses, 3 hours in the MEST Colloquium (MEST 4003), and 6 hours of Arabic beyond the Fulbright College language proficiency requirement (ARAB 2013).

**Arabic Requirement:** (6 hours of MEST credit) Students must complete 6 hours of Arabic language beyond the Fulbright College language proficiency requirement (ARAB 2013). Courses approved by the MEST director and completed in a summer intensive Arabic program or study-abroad program in an Arabic speaking country may substitute for all or part of this requirement.

**Middle East Studies Colloquium:** (3 hrs) Students must complete three hours in the Middle East Studies Colloquium (MEST 4003).

**Electives:** (up to 9 hours) Students may complete up to 9 hours in addition to the language requirement and the Colloquium requirement in individualized courses supervised by faculty participating in the program. Students choosing to take individualized reading or directed research courses as a part of the minor must obtain the approval of the MEST director and their major adviser.

SEE PAGE 311 FOR MIDDLE EAST STUDIES (MEST) COURSES

## MUSIC (MUSC)

Stephen Gates  
 Chair of the Department  
 201 Music Building  
 575-4701  
 Web Site: <http://www.uark.edu/depts/uamusic/>  
 Email: [music@uark.edu](mailto:music@uark.edu)

- Distinguished Professor Caldwell
- Professors Cencel, Detels, Gates, Greeson, Mains, Ragsdale, Sloan, Thompson, Wolpert
- Research Professor Markham
- Professors Emeriti Ballenger, Bright, Brothers, Cowell, Groh, Jackson, Janzen, Pilapil, Umiker, Widder, Worthley
- Associate Professors Jones, Misenhelter, Mueller, Ramey, Warren, Yoes
- Associate Professors Emeriti Colber, Johnson, Nastasi
- Assistant Professors Cholhitchanta, Hickson, Elizabeth Margulis, Jura Margulis
- Visiting Professor Janowski
- Visiting Assistant Professors Delaplain, Gunter, Lacy, Morris, Pettitt, Pratchard, Thomas

The music department strives to enrich and inspire the human mind and spirit through the pursuit of excellence in creative activity, research, teaching, and service. The Department of Music is an accredited institutional member of the National Association of Schools of Music. The requirements for entrance and for graduation as set forth in this catalog are in accordance with the published regulations of that Association.

### Degrees in Music

Two baccalaureate degrees in music are available: Bachelor of Music (see page 109 for general education requirements, see below for more detailed specific requirements), and the Bachelor of Arts with a Major in Music (see page 109 of this catalog for general education requirements, see below for more detailed specific requirements). To achieve junior standing in the curriculum leading to the Bachelor of Arts degree with a major in music and the Bachelor of Music degree, the student must have completed 56 hours and must have maintained a cumulative grade average of "C" in all music courses, with the exception of ensemble, by the end of the fourth semester. The student must also have earned a grade average of not less than "B" in the major applied field of study during the sophomore year. This standing is pre-requisite to all 3000-level courses and above in music.

All music majors are required to enroll in an ensemble in each semester of residence appropriate to their major area and with consent of their adviser.

**Piano proficiency requirement:** Students pursuing a Bachelor of Music degree must pass a piano proficiency examination upon entering the University of Arkansas or must register in piano class until this requirement is met.

On the basis of prior study in music, a student may be advised to omit one or more of the semesters of Aural Perception (MUTH 1621, MUTH 1631, MUTH 2621, MUTH 2631). Students will receive college credit for the omitted aural perception courses when they have validated their higher placement by passing the course in which they are placed with a grade of "B" or better.

**Writing Requirement:** Students can meet the Fulbright College writing requirement by submission of a satisfactory term paper for MUHS 4253.

**Requirements for a Major in Music leading to a Bachelor of Music Degree:** MUTH 1603, MUTH 1621, MUTH 1631, MUTH

2603, MUTH 2621, MUTH 2631, MUTH 3603, MUTH 3613, MUTH 4703 (except for music education majors), MUHS 3703, MUHS 3713, MUHS 4253 (except for music education majors), MUPD 3801, MUAC 2111, MUAC 2121 plus the following specific requirements by major area of emphasis.

**Piano Performance Major:** Applied Piano 28 hours, of which 16 must be at the upper level. (including MUAP 3201, 4201), Secondary MUAP or MUAC (2), MUHS 4803, MUHS 4813, MUTH 4682, MUTH 4692, MUPD 4842, MUPD 4852, MUEN 3411 (2), MUEN 3451 (6), electives (may be non-music): 7.

**Voice Performance Major:** Applied Voice 24 hours, of which 12 must be at the upper level (including MUAP 3201, MUAP 4201), Secondary MUAP or MUAC (4), MUAC 1121, MUAC 1141, MUAC 1151, MUPD 3861, MUHS 4763, MUHS 4773, Ensemble: 8 hours (see adviser for ensemble selection), electives (may be non-music): 4.

(NOTE: 9 hours additional foreign language is also required, foreign language study must include French, German, and Italian.)

**Stringed Performance Major:** Applied 28 hours, of which 16 must be at the upper level (including MUAP 3201, MUAP 4201), Secondary MUAP or MUAC (4), MUHS 4703, MUEN 3431 (8), MUEN 3501 (4), electives (may be non-music): 10.

**Woodwind, Brass or Percussion Performance Major:** Applied 24 hours, of which 12 must be at the upper level (including MUAP 3201, MUAP 4201), Secondary MUAP or MUAC (4), MUTH 4612, MUHS 4733. Large Ensembles 8, Small Ensembles 4, electives (may be non-music): 11.

**Guitar Performance Major:** Applied 28 hours, of which 16 must be at the upper level (including MUAP 3201, MUAP 4201), Secondary MUAP or MUAC (4), MUHS 4703. MUTH 4612, electives (may be non-music): 11.

**Theory or Composition Major:** MUAP 110V/310V (major-level applied 16 hours, MUAC 1221, MUAC 1231, MUAC 2221, MUAC 2231 (unless waived), MUPD 3811 or MUPD 3861, MUTH 4612, Composition: MUTH 164V, MUTH 364V (14), MUTH 4633, MUAP 4201, electives (may be non-music): 7. Theory: MUTH 164V, MUTH 364V (6), MUTH 4633, MUTH 498V (3), electives (may be non-music): 13, demonstration of piano skills appropriate for a composer or theorist.

**Music Education:** (all emphases) (in addition to requirements for the Bachelor of Music degree listed above) MUTH 4612, 14 MUAP/ MUAC (applied, including recital — see below), MUAC 1221, MUAC 1231, MUAC 2221, MUAC 2231 (except for piano majors — see below), 8 MUEN (see below), MUED 3021, MUED 3833, Plus the following specific requirements by emphasis.

Students who wish to apply for admission to the internship program in music education must complete the following Stages.

#### Stage I: Complete an Evaluation for Internship

Students must meet the following criteria to be cleared for the internship:

1. Declare the major in music education in the Fulbright Advising Center, Old Main 101.
2. 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.
3. Obtain a “C” or better in the following pre-education core courses: CIED 1002, CIED 1011, CIED 3023, CIED 3033, ETEC 2001, ETEC 2002L.
4. Obtain a “C” or better in MUED 3021 and MUED 3833.
5. Satisfactory completion of the Evaluation for Internship form. The Evaluation form must be completed by October 1 prior to doing a fall internship or March 1 prior to doing a spring internship. This form is available online at <[http://www.uark.edu/depts/coehp/boyer/Evaluation\\_for\\_internship/](http://www.uark.edu/depts/coehp/boyer/Evaluation_for_internship/)

Evaluation\_for\_Music\_Internship.doc>. The completed form must be returned to the Coordinator of Teacher Education, Peabody Hall room 8 no later than the stated deadline.

6. Complete the B.M. degree with a cumulative GPA of 2.50 or higher. The degree must be posted to your University of Arkansas transcript at the Registrar’s Office prior to internship.
7. Obtain departmental clearance for internship based on successful completion of portfolios, evaluation for internship, GPA requirements, course work requirements, selected written recommendations, an interview, and/or other requirements specified by your program.
8. Complete licensure packet available from the Coordinator of Teacher Education, Peabody Hall room 8.

All requirements in Stage I must be met to be cleared for the internship. Please contact the Coordinator of Teacher Education, Peabody Hall, Room 8, College of Education and Health Professions for more information.

#### Stage II: Internship

1. Complete the one-semester internship at an approved site in Washington or Benton counties.
2. Complete PRAXIS II requirements. See your adviser for completion dates.

**NOTE:** Students should always consult the Coordinator of Teacher Education for any 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.

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.

**Music Education, Wind/Percussion:** 14 MUAP to consist of 8 MUAP 110V, 5 MUAP 310V, MUAP 3201, 8 MUEN to consist of 2 MUEN 3441, 6 selected from MUEN 3431, MUEN 3441, MUEN 3461, MUEN 3481, MUEN 3511, 9 additional MUAC to consist of MUAC 1331, MUAC 1341, MUAC 1351, MUAC 1361, MUAC 1371, MUAC 2141, MUAC 1381, and either MUAC 1301 or MUAC 1311, MUPD 3811, MUED 4293, electives (may include MUTH 1003 and any MUEN): 6 .

**Music Education, Strings:** 14 MUAP to consist of 8 MUAP 110V, 5 MUAP 310V, MUAP 3201, 8 MUEN 3431, 8 additional MUAC to consist of 2 chosen from MUAC 1331, MUAC 1341, MUAC 2141, MUAC 1301, MUAC 1311, MUAC 1351, MUAC 1361, MUAC 1371 and MUAC 1381, MUPD 3811, MUED 4273, electives (may include MUTH 1003 and any MUEN): 6 .

**Music Education, Choral/Voice:** 11 MUAP to consist of 5 MUAP 110V, 5 MUAP 310V, MUAP 3201, MUAC 1121, MUAC 1141, MUAC 1151, 8 MUEN selected from MUEN 3411, MUEN 3451, 3 MUAC to include MUAC 1371, 1 of MUAC 1301 or MUAC 1311, 1 of MUAC 1331, MUAC 1341, MUAC 1351, MUAC 1361, or MUAC 2141, 2 MUAP 1001 Piano, 1 MUAP/MUAC by advisement, MUPD 3861, MUED 4283, electives (may include MUTH 1003 and any MUEN): 6 .

**Music Education, Choral/Piano:** 14 MUAP to consist of 8 MUAP 110V, 5 MUAP 310V, MUAP 3201, MUAC 1121, MUAC 1141, MUAC 1151, 8 MUEN selected from MUEN 3411, MUEN 3451, 3 MUAC to include MUAC 1371, 1 of MUAC 1301 or MUAC 1311, 1 of MUAC 1331, MUAC 1341, MUAC 1351, MUAC 1361, or MUAC 2141 , 4 MUAP 1001/3001 Voice, MUPD 3861, MUED 4283, electives (may include MUTH 1003 and any MUEN): 6 .

**Requirements for a Major in Music leading to a Bachelor of Arts Degree:** This program is for undergraduates who wish to major in



Music as part of a liberal arts program. A minimum of 42 semester hours in music to include: MUTH 1603, MUTH 1621, MUTH 1631, MUTH 2603, MUTH 2621, MUTH 2631, MUTH 3603, MUTH 3613, MUHS 3703, MUHS 3713, MUHS 4253, MUAC 1221, MUAC 1231, 8 hours (normally one or two hours per semester) of applied study on voice or on one instrument and 4 hours (4 semesters) of ensemble to be selected with the consent of their advisers.

A Bachelor of Arts degree with a combination of music-drama major may be obtained. See the chairman of the music department for the specific courses required for the degree.

**Requirements for Departmental Honors in Music:** The Departmental Honors Program in Music provides upper-division undergraduate students an opportunity to participate formally in scholarly, creative, or performance music activities. Honors candidates carry out independent study, research and performance under the guidance of the music faculty and participate in special honors classes and seminars. They must take 12 hours (which may include 6 hours of thesis) in Honors Studies.

For each student there is a committee consisting of at least the honors adviser, the major teacher in the area of the honors project, a member from a department outside the music department (chosen by the student), and a member of the Honors Council. This committee is responsible for hearing and seeing the work of the student in the area of the honors project and will administer the oral examination to the candidate at the end of the last semester of the student's work. The committee then recommends to the Honors Council whether or not the student receives honors in music. Outstanding student achievement will be recognized by awarding the distinction "Music Scholar *Cum Laude*" at graduation. The award of higher degree distinctions is recommended only in truly exceptional cases and is based upon the whole of the candidate's program of honors studies.

The student may elect to do the honors project in one of five areas: performance, music history and literature, theory, composition, or music education. Honors work may be done in an area other than the student's major area that is, a student majoring in voice performance may elect to do honors work in music history, theory, or composition, etc.

If a student wishes to devise his or her own honors project in consultation with a supervising professor and with the permission of the department chair, he or she may be granted honors. If a student wishes to combine work in more than one field and if the committee approves, he or she may be granted honors in more than one area, although the designation on the diploma will read "in music".

**The requirements for work in each area are as follows:**

I. Performance

- a. 2 semesters of MUAP 310VH, with concurrent registration in MUAP 3201H and MUAP 4201H
- b. Other music department honors courses are recommended, see honors adviser. (A program file representing the student's range of performance activities during the junior and senior years will be maintained for the department file and for the Honors Council. Cassette tapes of the junior and senior recitals will be filed with the Honors Office.)

II. History and Literature

- a. Junior year MUHS 5973, Seminar in Bibliography and Methods of Research
- b. Senior year MUSC 4903H, Honors Essay

III. Theory

- a. Junior year MUHS 5973, Seminar in Bibliography and Methods of Research
- b. Senior year MUSC 4903H, Honors Essay

IV. Composition

- a. At least six hours of MUTH 364VH, Honors Composition II
- b. A full program of original compositions or equivalent.

V. Music Education

- a. Junior year – MUED 5513, Seminar: Resources in Music Education

- b. Senior year – MUSC 4903H, Honors Essay

**Requirements for a Minor in Music:** A minimum of 18 semester hours in music courses, of which at least nine hours must be selected from MUTH, MUHS, and/or MLIT courses, the specific courses to be determined by the student in consultation with a music faculty adviser, the adviser to be appointed by the music faculty on the basis of each student's particular interests. The student must notify the Department of Music of his/her intent to minor.

For requirements for advanced degrees in music, see the *Graduate School Catalog*.

SEE PAGES 313 - 316 FOR MUSIC (MLIT THROUGH MUTH) COURSES

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## PHILOSOPHY (PHIL)

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Thomas D. Senor

Chair of the Department

318 Old Main

575-3551

Web Site: <http://www.uark.edu/depts/philinfo/>

E-Mail: [phildept@uark.edu](mailto:phildept@uark.edu)

- Professor Spellman
- Professors Emeriti Edwards, Nissen
- Associate Professors Adler, Lee, Minar, Senor
- Assistant Professors Lyons, Scott, Ward

**Requirements for a Major in Philosophy:** 30 semester hours in philosophy to include PHIL 2203 or PHIL 4253, and PHIL 4003, PHIL 4033, and six hours to be chosen from PHIL 4013, PHIL 4023, PHIL 4043, PHIL 4063, PHIL 4073, and PHIL 4083.

**Writing Requirement:** The writing requirement can be satisfied either by completion of an acceptable thesis or by approval of a research/analytical paper from any 4000-level course in philosophy submitted by the student to the Philosophy Department's Undergraduate Committee.

**Requirements for Departmental Honors in Philosophy:** The purpose of the honors program is to provide the honors candidate with the opportunity of achieving greater maturity in dealing with philosophical ideas through independent study. The candidate's plan of study will include the reading of significant philosophical works. Normally a candidate will complete a total of three to six hours of independent readings in philosophy during his or her junior and senior years. In addition, it is recommended that the candidate register for honors courses and colloquia, one colloquium is required.

The candidate will be expected to take 12 hours (which may include 6 hours of thesis) in Honors Studies and to write an essay during his or her senior year and give a satisfactory account of the honors readings and senior essay in an oral examination. Successful completion of the requirements will be recognized by the award of the distinction "Philosophy Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Requirements for a Combined Major in Philosophy and African-American Studies:** 36 semester hours, consisting of 18 hours in philosophy and 18 hours in African-American studies. The philosophy requirement is: 18 semester hours in philosophy to include either 12 hours over 3000 and PHIL 2203 or PHIL 4253, or 15 hours over 3000. The hours over the 3000-level must include at least three hours of value theory to be chosen from PHIL 4113, PHIL 4123, PHIL 4133, or PHIL 4143, and at least six hours in the history of philosophy (PHIL 4003, PHIL 4013, PHIL 4023, PHIL 4033, PHIL 4043, PHIL 4063, PHIL



4073, PHIL 4083) including PHIL 4003 or PHIL 4033. See African-American studies on page 116.

**Requirements for a Minor in Philosophy:** 18 semester hours in philosophy to include PHIL 2203 or PHIL 4253, and either PHIL 4003 or PHIL 4033. A student may earn either a minor or a combined major in philosophy but not both. A student must notify the Department of his or her intent to minor.

For requirements for advanced degrees in philosophy, see the *Graduate School Catalog*.

SEE PAGE 319 FOR PHILOSOPHY (PHIL) COURSES

## PHYSICS (PHYS)

William F. Oliver, III  
Chair of the Department  
226 Physics Building  
575-2506

Web Site: <http://www.uark.edu/depts/physics/>  
E-Mail: [physics@cavern.uark.edu](mailto:physics@cavern.uark.edu)

- University Professor Salamo
- Professors Gea-Banaoche, Gupta, Harter, Lacy, Lieber, Pederson, Singh, Vyas, Xiao
- Research Professor Vickers
- Professor Emeritus Hobson
- Associate Professors Oliver, Stewart, Thibado
- Assistant Professors Bellaiche, Fu, Li

**Requirement for B.S. Degree with a Major in Physics:** The student must present a minimum of 40 semester hours in physics including PHYS 2054/2050L, PHYS 2074/2070L, PHYS 2094/2090L, PHYS 3414, PHYS 3614, PHYS 4073, PHYS 4991 and courses in one of five concentrations:

**Professional:** PHYS 3113, PHYS 4333, and 10 semester hours numbered 3000 and above in physics or astronomy,

**Optics:** PHYS 3544, any 2 courses selected from PHYS 4734, PHYS 4754, PHYS 4774 and PHYS 4794, and 4 semester hours numbered 3000 and above in physics or astronomy,

**Electronics:** PHYS 220V (up to 2 hours), PHYS 320V (2 or more hours), PHYS 4333, PHYS 4713, and 6 semester hours numbered 3000 and above in physics or astronomy,

**Computational:** PHYS 3113 and 13 semester hours including courses numbered 3000 and above in physics or astronomy with up to 9 hours of advanced computer science or mathematics chosen with the adviser's permission.

**Biophysics:** PHYS 3113 and 13 semester hours including courses numbered 3000 and above in physics, astronomy, biology and chemistry chosen with the adviser's permission.

**For all five of the possible concentrations the following mathematics courses are required:** MATH 2554, MATH 2564, MATH 2574, MATH 3404, and MATH 3423. CSCE 4513 can be substituted for MATH 3423 with the adviser's approval. In addition, CHEM 1103/1101L and CHEM 1123/1121L, or an approved 8 hours of laboratory-based courses in CSCE (CSCE 1113/1111L and CSCE 1123/1121L) or CENG (CENG 1113/1111L and CENG 1123/1121L), or an approved 9 hours of courses in CSCE (CSCE 1113, CSCE 1123, CSCE 2143, CSCE 3313) or CENG (CENG 1113, CENG 1123, CENG 2143, CENG 3313, OR CENG 1913) are required.

Majors must propose participation in a research experience project no later than the end of their junior year of study. A written report of the results must be submitted during Senior Seminar (PHYS 4991).

**Requirements for a B.A. Degree with a Major in Physics:** This track is for students desiring a broader program in the arts, sciences, and

social sciences while majoring in physics. This program is recommended for pre-medical, journalism, pre-business, pre-law and other students planning careers in fields for which a physics education would be beneficial. For B.A. Physics students seeking teaching licensure, see the Teacher Licensure Requirements below. This program requires a total of 124 semester hours. The student must present 24 semester hours in physics or astronomy, including PHYS 2013/2011L, PHYS 2033/2031L, PHYS 3603/3601L, PHYS 4991, and 11 semester hours chosen from PHYS 220V and/or any physics or astronomy courses at the 3000 level or above. The student must also present MATH 1285 (or MATH 1203 and MATH 1213) and MATH 2554 (or MATH 2043) as well as two additional courses at the 2000 level or above in mathematics, statistics or ISYS 2013. An additional 9 semester hours at the 3000 level or above must be taken from a single special emphasis area chosen with the adviser's approval. The special emphasis area may be chosen in any single degree-granting department at the University of Arkansas. For B.A. Physics students seeking teacher licensure, the special emphasis area may involve courses from more than one degree-granting department at the University of Arkansas with the approval of their adviser.

**Writing Requirement:** Students majoring in physics may satisfy the Fulbright College writing requirement by means of a senior thesis (PHYS 498V), honors thesis submitted in fulfillment of the requirements of the honors program (PHYS 399VH), or by means of a paper submitted as part of PHYS 4991 or any physics or astronomy course numbered 3000 or above. Students electing the last route must obtain approval of the instructor during the first three weeks of the semester. The research/analytical paper should demonstrate competency in the use of word processing software and also at least one computer analytical tool such as a spreadsheet, mathematical, or graphics program, or an original program written by the student.

**Assessment of Student Learning:** In accordance with state, university, and college requirements, all students must have learning assessed before graduation. Students majoring in physics will be assessed in the course PHYS 4991, which must be taken in the year prior to graduation.

**Requirements for Departmental Honors in Physics:** The Departmental Honors Program in Physics provides upper-division undergraduate students with an opportunity to formally participate in scholarly physics activities. Honors candidates carry out independent study and research under the guidance of the physics faculty and participate in special honors classes, seminars, and colloquia. Outstanding student achievement will be recognized by awarding the distinction "Physics Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies. To be considered as a candidate for higher distinctions, however, a student must achieve at least a 3.50 cumulative grade-point average in physics and mathematics. In addition to satisfying the general college requirements for the bachelor's degree with honors, an honors candidate in physics must

1. become a candidate no later than the first semester of the junior year of study,
2. enroll in honors sections of physics courses when available,
3. enroll in six hours of honors research PHYS 399VH,
4. enroll in at least one physics honors colloquium PHYS 3923H,
5. complete and orally defend an honors thesis based upon the project carried out in PHYS 399VH, and
6. achieve a cumulative grade-point average of 3.125 in physics.

**Requirements for a Minor in Physics:** Students wishing to obtain a minor in physics must take either PHYS 2013/2011L, PHYS 2033/2031L or PHYS 2054/2050L, PHYS 2074/2070L, plus at least seven additional hours of physics courses numbered 3000 or above. A student must notify the Department of his or her intent to minor.

**Physics (B.A. or B.S.) Physical/Earth Science Teacher Licensure Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advis-

- ing Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
  3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
  4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
  5. Students wanting to teach science in middle school should consult with a middle level adviser in the College of Education and Health Professions.

SEE PAGE 320 FOR PHYSICS (PHYS) COURSES

## POLITICAL SCIENCE (PLSC)

Todd G. Shields

Chair of the Department

428 Old Main

575-3356

Web Site: <http://www.uark.edu/depts/plscinfo/>

- Professors Kelley, Waligorski
- Professors Emeriti Neuse, Savage, Vanneman
- Associate Professors Conge, Kerr, Miller, Reid, Ryan, Shields
- Associate Professor Emeritus Tweraser
- Assistant Professors Ghabbian, Hansen, Parry, Schreckhise, Zeng
- Assistant Professors Emeriti Elston, Reed

### Requirements for B.A. Degree with a Major in Political Science:

30 semester hours at least 21 of which must be above 3000.

1. Students are required to take both PLSC 2003 (American National Government and PLSC 2013 (Introduction to Comparative Politics)
2. Students must choose one of the following:
  - PLSC 2813 (Introduction to International Relations)
  - PLSC 3103 (Introduction to Public Administration)
  - PLSC 3963 (Modern European Political Thought)
3. Students fulfill the remaining requirements from among any of the available political science courses. The only stipulation is that at least 21 hours must be in the 3000-4000 level.

#### American Politics

PLSC 2003, PLSC 3203, PLSC 3223, PLSC 3243, PLSC 3253, PLSC 4203, PLSC 4213, PLSC 4223, PLSC 4243, PLSC 4253, PLSC 4263, PLSC 4273, PLSC 4283, PLSC 4373

#### Comparative Politics

PLSC 3503, PLSC 3523, , PLSC 3553, PLSC 3573, PLSC 4503, PLSC 4513, PLSC 4543, PLSC 4563, PLSC 4573, PLSC 4583, PLSC 4593

#### International Politics

PLSC 3803, PLSC 3813, PLSC 3823, PLSC 3853, PLSC 4803, PLSC 4843, PLSC 4873

#### Political Theory

PLSC 3603, PLSC 3913, PLSC 3933, PLSC 3953, PLSC 3963, PLSC 3973, PLSC 3983, PLSC 4503, PLSC 4903

#### Public Administration

PLSC 3103, PLSC 3113, PLSC 3153, , PLSC 4193

**Writing Requirement:** The college writing requirement is fulfilled by submitting an acceptable research/analytical paper to the department for approval at least four weeks prior to graduation. The paper may be derived from completion of an honors essay (PLSC 499VH), a senior thesis (PLSC 498V), or some other advanced course in political science. The student is urged to consult with his or her faculty adviser no later than early in the first semester of the senior year.

**Requirements for Departmental Honors in Political Science:** The Departmental Honors Program in Political Science offers junior and senior students the opportunity to enroll in enriched and advanced courses and to do independent research in their senior year. Honors candidates are eligible for honors colloquia, honors courses, some advanced seminars and an independent studies project, usually in close collaboration with one or more members of the faculty.

In addition to satisfying the general college honors requirements for the bachelor's degree, honors candidates in political science must successfully complete at least 12 hours of honors work. Six of the 12 hours will be senior essay credit (PLSC 499VH) and will be taken during the senior year. Successful completion and defense of senior essay or thesis is a major part of the Political Science Honors Program and students should begin discussing it with the Honors Adviser during their junior year. The preferred methods for satisfying the remaining six hours is to enroll in an honors colloquium (3923H) in political science or another department, by enrolling in a graduate seminar in political science, or, by enrolling in PLSC 399VH (honors course).

Under exceptional circumstances, students may satisfy honors requirements by enrolling in PLSC 394V, by enrolling in honors sections in other departments, or by enrolling in colloquia or graduate seminars in other departments, each of which requires approval by the department chairperson. Successful completion of the requirements will be recognized by the award of the distinction "Political Science Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies. For full details consult the chairperson of the political science department.

### Political Science (B.A.) Social Studies Teaching Licensure Requirements:

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, may be used as electives in student's program of study:
  - 6 hours of geography, including GEOG 1123, Human Geography
  - 9 hours of American history, including HIST 2003, HIST 2013
  - 3 hours of Sociology or Anthropology
  - PLSC 2003, American National Government
  - PLSC 2203, State and Local Government OR
  - PLSC 3223, Arkansas Politics
  - PSYC 2003, General Psychology
6. The following courses are specifically required for licensure:
  - ECON 2013 or ECON 2023 or ECON 2143
  - HIST 3383, Arkansas History
7. Students wanting to teach social studies in middle school should consult with a middle level adviser in the College of Education and Health Professions.

### Combined Majors

**Political Science and African-American Studies:** For the requirements for a combined major in political science and African-American studies, see page 116.

**Political Science and Journalism:** The combined major in political science and journalism is recommended for those students who have a strong interest in the reporting of public affairs as a career. The political science requirement may be satisfied by 24 semester hours of courses

including PLSC 2003, PLSC 2013, PLSC 4373, and 15 additional hours of advanced political science courses elected from one or the other of two field concentrations. Those wishing to emphasize American political affairs may elect the additional hours from the following:

PLSC 3103,	PLSC 3113,	PLSC 3153,	PLSC 3183,
PLSC 3203,	PLSC 3223,	PLSC 3243,	PLSC 3253,
PLSC 3603,	PLSC 3853,	PLSC 3923H,	PLSC 3913,
PLSC 3933,	PLSC 394V,	PLSC 3973,	PLSC 3983,
PLSC 399VH,	PLSC 4193,	PLSC 4203,	PLSC 4213,
PLSC 4223,	PLSC 4243,	PLSC 4253,	PLSC 4263,
PLSC 4273, or	PLSC 4903		

Alternatively, a foreign affairs concentration may be pursued by electing the advanced hours from the following courses:

PLSC 3503,	PLSC 3523,	PLSC 3533,	PLSC 3553,
PLSC 3573,	PLSC 3603,	PLSC 3803,	PLSC 3813,
PLSC 3823,	PLSC 3853,	PLSC 3923H,	PLSC 394V,
PLSC 3953,	PLSC 3963,	PLSC 3973,	PLSC 3983,
PLSC 399VH,	PLSC 4273,	PLSC 4503,	PLSC 4513,
PLSC 4543,	PLSC 4563,	PLSC 4573,	PLSC 4803,
PLSC 4583,	PLSC 4593,	PLSC 4803,	PLSC 4813,
PLSC 4823,	PLSC 4843, or	PLSC 4873.	

The journalism requirement may be satisfied by 24 semester hours of courses including JOUR 1023, JOUR 2013, JOUR 3013, JOUR 3023, JOUR 3633, and JOUR 4043, plus two courses from the following: JOUR 3133, JOUR 3333.

**Political Science and Latin American Studies:** For the requirements for a combined major in political science and Latin American studies, see page 140.

**Requirements for a Minor in Political Science:** 18 hours including PLSC 2003 or PLSC 2013. At least 9 of these hours must be in courses numbered 3000 or above, and courses must be chosen from at least two of the five political science fields. Students should consult with an adviser in the department for the selection of appropriate courses.

**Minor in Legal Studies:** This minor will introduce undergraduate students to the study and application of law by taking law-related courses in a number of disciplines. It provides a focus for students who are interested in the law, whose careers will require a measure of legal knowledge, or for those considering entering law school.

**Requirements for a Minor in Legal Studies:** 18 semester hours to include the following:

PLSC 3243, PLSC 4253 or PLSC 4263

12 hours chosen from the following:

COMM 4113,  
ENGL 419V (when appropriate),  
JOUR 3633,  
PHIL 4143,  
CMJS 3003, CMJS 3503,  
PLSC 3813, PLSC 4193,  
SCWK 3533,  
ARCH 5323,  
BLAW 2013, BLAW 3033, BLAW 3043,  
AGEC 3503,  
INEG 3113,  
OMGT 4313

For requirements for the M.A. degree in political science, the M.P.A. degree, or the combined J.D./M.P.A. degree, see the *Graduate School Catalog*.

### **Public Administration**

The degree in public administration is designed to prepare students

for career positions with local, state, or federal government agencies, labor organizations, non-governmental organizations and other groups. These organizations are constantly in need of able people thoroughly trained in the principles of public administration and management, government budgeting, economic planning, and economic research.

The B.S.P.A is a flexible, liberal arts degree with a strong secondary emphasis in business administration. This flexibility results from the choice of junior-senior electives (approximately 13 hours) from business, economics, or political science. The B.S.P.A adviser can assist in structuring a personalized degree plan with these hours that may enhance a student's future options.

**Requirements for B.S. Degree with a Major in Public Administration:** The student must complete the following 33 hours in business administration:

ACCT 2013, ACCT 2023,  
ISYS 1121L, ISYS 2013, ISYS 2232, ISYS 3333,  
ECON 2013, ECON 2023, ECON 3333,  
FINN 3043

The student must also complete the following political science courses:

PLSC 2003, PLSC 2203, PLSC 3103, PLSC 3113,  
PLSC 3153, PLSC 3183, PLSC 4193, PLSC 4283

An additional 19 hours (approximately) of junior or senior electives in business administration or economics or political science (selected with the consent of an adviser) must be completed. 18 hours of science and math are required to include at least 12 hours laboratory natural sciences and 6 hours of math (Math 2053 or higher is recommended).

SEE PAGE 322 FOR POLITICAL SCIENCE (PLSC) COURSES

### **PSYCHOLOGY (PSYC)**

David A. Schroeder

Chair of the Department

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575-4256

Web Site: [www.uark.edu/depts/psyc](http://www.uark.edu/depts/psyc)

E-Mail: [psycapp@uark.edu](mailto:psycapp@uark.edu)

- University Professor Emeritus Dana
- Professors Cavell, Knowles, Lohr, Schroeder, Stripling
- Professors Emeritus Marr, Schuldt, Trapp, Witte
- Associate Professors Behrend, Beike, Freund, Petretic, Westendorf
- Associate Professors Emeritus Bonge, Danforth, Mobley
- Assistant Professors Bering, Fuendeling, Lampinen, Levine, Murray, Williams
- Adjunct Assistant Professor Nelson
- Clinical Assistant Professors Jenkins, Patton, Perry

#### **Requirements for B.A. Degree with a Major in Psychology:**

Minimum of 30 semester hours to include PSYC 2003, PSYC 2013, PSYC 3073, minimum of one course chosen from PSYC 3083, PSYC 3183, PSYC 3283, PSYC 3383, PSYC 3483, PSYC 3583, PSYC 3683, PSYC 3783, six hours chosen from PSYC 3103, PSYC 4073, PSYC 4123, PSYC 4143, PSYC 4183, PSYC 4193, and six hours chosen from PSYC 3013, PSYC 3023, PSYC 3033 (or PSYC 3093), PSYC 4053, PSYC 4063, and remaining hours as free electives chosen from any psychology course in this catalog. A 2.00 cumulative grade-point average on all work completed in the Department of Psychology (including a grade of "C" or higher in PSYC 3083, PSYC 3183, PSYC 3283, PSYC 3383, PSYC 3483, PSYC 3583, PSYC 3683, or PSYC 3783) will be required for graduation with a B.A. degree.

Students who want to pursue graduate training in psychology are advised to begin preparations early in their undergraduate careers.



Grade-point average, scores on the Graduate Record Examinations, effective communications skills, preparation in the natural sciences and mathematics, and research experience (e.g., honors project, independent readings) are the major criteria considered by admissions committees.

Students with applied, paraprofessional, or human-service interests who plan to enter the job market with a B.A. in psychology are strongly encouraged to take relevant courses in anthropology, sociology, social work, human development and family studies, and education. Students interested in business applications of psychology (e.g., marketing, management) are similarly encouraged to take related courses in the Walton College of Business, minors are also available in several areas of business. For more information concerning psychology as a major or careers in psychology and related fields, please contact the Psychology Advising Coordinator (203 Memorial Hall).

**Writing Requirement:** Students majoring in Psychology will satisfy the Fulbright College writing requirement by successful completion of PSYC 3083, PSYC 3183, PSYC 3283, PSYC 3383, PSYC 3483, PSYC 3583, PSYC 3683, or PSYC 3783, each of which requires a final research paper.

**Requirements for Departmental Honors in Psychology:** The Departmental Honors Program in Psychology provides upper-division undergraduate students with an opportunity to formally participate in scholarly psychology activities. Honors candidates carry out independent study and research under the guidance of the psychology faculty and participate in special honors classes, seminars, and colloquia. Outstanding student achievement will be recognized by awarding the distinction "Psychology Scholar *Cum Laude*" at graduation. In addition to satisfying the general college honors requirements, honors candidates in psychology are required to complete and orally defend an honors thesis based upon the independent study carried out in PSYC 399VH. PSYC 399VH may be taken for 1 to 6 hours of credit each semester and repeated for a maximum of 12 hours. Nine hours are ordinarily needed to complete the research project and to prepare the honors thesis.

Honors candidates in psychology are encouraged to enroll in as many honors classes, seminars, and colloquia as possible. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Requirements for a Minor in Psychology:** Minimum of 18 hours including PSYC 2003, PSYC 2013, and PSYC 3073. A maximum of three hours of 306V can be counted toward meeting the minor requirement. A student must notify the department of his or her intent to minor.

**Psychology (B.A.) Teacher Licensure in Social Studies Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, may be used as electives in student's program of study:
  - 6 hours of geography, including GEOG 1123, Human Geography
  - 9 hours of American history, including HIST 2003, HIST 2013
  - 3 hours of Sociology or Anthropology
  - PLSC 2003, American National Government
  - PLSC 2203, State and Local Government OR
  - PLSC 3223, Arkansas Politics
  - PSYC 2003, General Psychology
6. The following courses are specifically required for licensure:

ECON 2013 or ECON 2023 or ECON 2143

HIST 3383, Arkansas History

7. Students wanting to teach social studies in middle school should consult with a middle level adviser in the College of Education and Health Professions.

For requirements for advanced degrees in psychology, see the *Graduate School Catalog*.

SEE PAGE 325 FOR PSYCHOLOGY (PSYC) COURSES

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## RELIGIOUS STUDIES (RLST)

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Lynda L. Coon

Chair of Studies

506 Old Main

575-6776

Web Site: <http://cavern.uark.edu/depts/h2p/index.html>

- Professors Cornell (V.), Cory, Engels, Haydar, King, Levine, McCartney, Montgomery, Schneider, Spellman, Tsai
- Associate Professors Adler, Chappell, Coon, Finlay, Gordon, Senior, Tucker, Worden
- Assistant Professors Cornell (R.), D'Alisera, Erickson, Halman, Schweiger

Drawing on faculty from the humanities and social sciences, this minor introduces students to the interdisciplinary and comparative study of religion.

**Program Requirements:** Students must complete 15 credit hours of regular courses listed below or special topics and seminars found in each semester's Schedule of Classes under Religious Studies. Of that 15 hours, 3 hours must include HUMN 2213 (World Religions). Students also must choose ONE of the following gateway options:

ANTH 3123, Anthropology of Religion,

HUMN 3203, Approaches to Religious Studies, or

PHIL 4303, Philosophy of Religion

A maximum of six hours may be presented from courses taken in the student's major department.

ANTH 3123, The Anthropology of Religion

ANTH 3213, Indians of North America

ANTH 3263, Indians of Arkansas and the South

ANTH 4513, African Religions: Gods, Witches, Ancestors

CLST 4003H, "Greek Religion" or "Greek Sacred Space" or "Roman Religions"

ENGL 3623, The English Bible

GREK 2003, Greek New Testament

HIST 3003, History of Christianity

HIST 3033, Islamic Civilization

HIST 3083, Women and Christianity

HIST 3263, History of the American Indian

HIST 3923H, Honors Colloquium: Sufism

HIST 3923H, Honors Colloquium: Honors Approaches to Religious Studies

HIST 4043, Late Antiquity and the Early Middle Ages

HIST 4053, Late Middle Ages

HIST 4073, Renaissance and Reformation Europe

HIST 4313, History of China to 1644

HIST 4353, Middle East 600-1500

HIST 4373, Mongol & Mamluk Middle East 1250-1520

HIST 4393, The Ottoman Empire and Iran 1300-1722

HIST 4533, American Social and Intellectual History to 1865

HUMN 2213, World Religions

HUMN 3003, Religions of Asia

HUMN 3163, On Death and Dying



HUMN 3203, Approaches to Religious Studies  
 HUMN 3923H, "Thomas Merton" or "St. Peter's and the Vatican"  
 HUMN 4043, Religion and Film  
 HUMN 425V, Colloquium: Hebrew Bible in Translation  
 HUMN 4913, Literary Reflections of the Holocaust  
 PHIL 4013, Platonism and the Origin of Christian Theology  
 PHIL 4023, Medieval Philosophy  
 PHIL 4303, Philosophy of Religion  
 PLSC 4593, Islam and Politics  
 SOCI 3103, Religion and Society  
 WLIT 2323, Greek and Roman Mythology  
 WLIT 2333, Patterns in Mythology  
 WLIT 3983, Qur'an and Mid Eastern Literature

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### RUSSIAN STUDIES (RSST)

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Donald R. Kelley  
 Chair of Studies  
 722 W. Maple  
 575-2006

- Professors Kelley (political science), Gay (economics)
- Assistant Professors Ferrier (economics), Starks (history), Tucker (foreign languages)

The Russian studies program focuses on the pre-Revolutionary period prior to 1917, on the communist period from 1917 to 1991, and on the post-communist period from 1991 onward. The geographic focus includes Russia, the other successor states that have emerged from the breakup of the Soviet Union, and East Europe.

Students wishing to maximize their knowledge of Russia and the other successor states and wishing to prepare for graduate training and/or employment in the private sector or government in positions related to the area may earn a combined major in Russian studies together with their major in another discipline. Students are required to coordinate their academic programs both with their advisers in the major department and with the Chairman of the Russian studies program. New students entering the program are required to notify both the major adviser and the Chairman of Studies of their intention to participate. Freshmen and sophomores considering this program are advised to begin their study of Russian as early as possible.

**Language Requirement:** The student must complete the equivalent of a third year of Russian language training such as RUSS 3013 and RUSS 3023. Students are strongly encouraged to obtain at least a portion of this training in an intensive summer or semester program which provides concentrated instruction beyond the conventional class experience.

**Russian Studies Colloquium:** The student must complete at least three hours in the Russian Studies Colloquium (RSST 4003). The Colloquium may be repeated with a change of subject for a maximum of six credits, with the three additional credits counted as non-departmental electives within the program.

**Electives:** The student must complete at least 18 hours in addition to the language requirement and the Colloquium, in courses with specific content related to Russian studies, or in individualized courses under faculty participating in the program. Students choosing to take individualized reading or directed research courses as a part of the RSST program must obtain the approval of the Chairman of Studies and their major adviser.

The following conditions apply to the selection of Russian studies electives:

1. courses must be selected from at least three separate departments,
2. a maximum of nine hours may be submitted from courses taken in any one department, and
3. a maximum of nine hours may be submitted from courses taken in

the student's major department.

The following courses may be taken in fulfillment of elective requirements:

#### **Economics**

ECON 4533, Comparative Economic Systems

#### **Foreign Language**

RUSS 4123, Survey of Russian Literature from its beginnings to the 1917 Revolution

RUSS 4133, Survey of Russian Literature

RUSS 475V, Special Investigations

#### **History**

HIST 4283, Russia to 1861

HIST 4293, Russia Since 1861

#### **Political Science**

PLSC 394V, Readings in Political Science

PLSC 4513, Creating Democracies

PLSC 4543, Government & Politics of Eastern Europe

PLSC 4563, Government & Politics of Russia

PLSC 4813, Politics of the Cold War

PLSC 5563, Russian and Soviet Political System

SEE PAGE 328 FOR RUSSIAN STUDIES (RSST) COURSES

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### SOCIAL WORK (SCWK)

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Joe Schriver

Director of the School of Social Work

106 ASUP

575-5039

Web Site: [www.uark.edu/depts/scwk/](http://www.uark.edu/depts/scwk/)

- Professor King
- Associate Professor Schriver
- Associate Professor Emerita McGetrick
- Assistant Professor Reese
- Research Professor Schriner
- Research Associate Professor Page
- Visiting Assistant Professors Greer, Hall, House

The social work program is fully accredited at the baccalaureate level by the Council on Social Work Education. The principal objective of the social work program is to prepare students for beginning generalist social work practice. Contact school director for admission and retention requirements.

**Requirements for a Major in Social Work:** 45 semester hours of social work courses including:

SCWK 2133, Introduction to Social Work

SCWK 4073, Social Work Research and Technology I

SCWK 4093, Human Behavior and the Social Environment I

SCWK 4103, Human Behavior and the Social Environment II

SCWK 4153, Social Welfare Policy

SCWK 3193, Human Diversity and Social Work

SCWK 4333, Social Work Practice I

SCWK 4343, Social Work Practice II

SCWK 4412, Field Seminar I

SCWK 4422, Field Seminar II

SCWK 4434, Social Work Internship I

SCWK 4444, Social Work Internship II

SCWK 4733, Social Work Practice III

Social Work electives - 6 hours

(Students must adhere to requirements cited for each social work course. A grade of 'C' or better must be earned in all core social work courses. If a student receives a grade of 'D' in a core social work course, the course must be retaken with a grade of 'C' or better prior to taking

the course for which that course serves as a prerequisite.)

The following social science and general education courses are also required as part of the social work curriculum:

American National Government (PLSC 2003)  
 General Sociology (SOCI 2013)  
 Principles of Biology (BIOL 1543/1541L)  
 Fundamentals of Communication (COMM 1313)  
 General Psychology (PSYC 2003)  
 Statistics course, 3 hours  
 Economics (ECON 2143)

In addition, six hours of upper-level (3000-4000) social science electives, to be selected from SOCI, PSYC, ANTH, GNST, PLSC, COMM, GEOS, ASST, or HESC complete the degree requirements.

**Writing Requirement:** Social work students complete the research/analytical writing requirement by submitting the research paper from SCWK 3073 or honors paper to the social work faculty for approval.

**Requirements for Departmental Honors in Social Work:** The Departmental Honors Program in Social Work is an upper-division course of study with an independent investigation on a topic in social work. Students work closely with an adviser of their choice to define the goals of an honors project and to develop it to completion. They must take 12 hours (which may include 6 hours of thesis) in Honors Studies. In developing the project, students are encouraged to take honors courses, participate in honors colloquia and do extensive background reading. Some may choose a library research project, others may choose a field project. In either case the honors work is a serious long-term undertaking that should have direct value in supplementing the student's regular departmental academic program. Enrollment in SCWK 399VH takes place after the student has done background reading and has actually begun a project. Students normally enroll for course work the equivalent of three hours of credit. Whether the completed project is library research or one in field practice, it is presented in written form and defended at an oral examination by an Honors Council Committee. Projects of extraordinarily high quality may be designated High Honors by the Committee. Successful completion of the requirements will be recognized by the award of the distinction "Social Work Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Requirements for a Minor in Social Work:** 18 hours including SCWK 2133, SCWK 3193 and SCWK 3153 (required) and any other nine hours of social work electives. A student must notify the department of his or her intent to minor. The social work minor is not preparation for social work practice and is not accredited by CSWE.

SEE PAGE 329 FOR SOCIAL WORK (SCWK) COURSES

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## SOCIOLOGY AND CRIMINAL JUSTICE (SOCI)

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William Schwab  
 Chair of the Department  
 211 Old Main  
 575-3205  
 Web Site: <http://www.uark.edu/depts/social>

- University Professor Ferritor
- Professors Morgan, Schwab, Smith
- Professors Emeriti Mangold, McNeil, Prassel, Rice
- Associate Professors Adams, Holyfield, Koski, Patnoe, Worden, Zajicek
- Associate Professor Emeritus Sieger
- Assistant Professors Huggins, Taylor, Yang
- Instructors Newman, Thompson

A Bachelor's of Arts (B.A.) degree in sociology is useful preparation not only for graduate work in sociology, but also for pre-professional training in other fields, such as medicine, law, human services, or related work in the government.

**Requirements for B.A. Degree with a Major in Sociology:** 31 semester hours, to include SOCI 2013, SOCI 3193, SOCI 3223, SOCI 3301L, SOCI 3303, SOCI 3313, SOCI 4023, SOCI 4043 and 9 hours from sociology 3000- and 4000-level electives.

**Writing Requirement:** To fulfill the Fulbright College writing requirement, each sociology major will submit, prior to graduation, a substantial research or analytical paper, with a grade of "A" or "B" from an upper-division sociology course (3000-, 4000-, or 5000-level) to their departmental adviser. Satisfactory completion of an honors project or a senior thesis may fulfill this requirement.

**Requirements for Departmental Honors in Sociology:** The Departmental Honors Program in Sociology is an upper-division course of study based on independent investigation on a scholarly topic of sociological interest. To be eligible for sociology honors candidacy, students normally will have completed 28 semester hours and not more than 85 semester hours with a minimum cumulative grade-point average of 3.25. They must take 12 hours in Honors Studies, which may include 6 hours of thesis. In the junior year, three hours of directed reading, planning, or other work on a research problem should be selected from the following courses:

Honors Course 399VH  
 Individual Study in Sociology, 403V  
 Seminar in Sociology, 4043

In the senior year, the student will complete an honors project for up to six hours of credit in SOCI 399VH, Honors Course. This honors research project will normally consist of an empirical investigation but may, with the approval of the honors director and the other departmental representatives, be intensive library research on a topic. All candidates must pass an oral examination given by an Honors Council Committee. Successful completion of the requirements will be recognized by the award of the distinction "Sociology Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

**Requirements for a Minor in Sociology:** 19 semester hours in sociology to include SOCI 2013, SOCI 3301L, SOCI 3303, SOCI 3313, and at least nine hours of 3000-level classes or above. A student must notify the department of her or his intent to minor.

**Sociology (B.A.) Teacher Licensure in Social Studies Requirements:**

1. Declare the Pre-Education (ASED) minor in the Fulbright Advising Center, Old Main room 101.
2. Complete the Pre-Education (ASED) minor. All courses for the minor must be completed with a grade of "C" or higher. (See page 119.)
3. Complete PSYC 2003. (This course is a pre-requisite to CIED 3033.)
4. Complete the Admission Process for Initial Teacher Licensure Stages I-IV as detailed in the College of Education and Health Professions section on page 171.
5. The following courses are recommended for licensure, and with approval of adviser, may be used as electives in student's program of study:
  - 6 hours of geography, including GEOG 1123, Human Geography
  - 9 hours of American history, including HIST 2003, HIST 2013
  - 3 hours of Sociology or Anthropology
  - PLSC 2003, American National Government
  - PLSC 2203, State and Local Government OR
  - PLSC 3223, Arkansas Politics

PSYC 2003, General Psychology

6. The following courses are specifically required for licensure:

ECON 2013 or ECON 2023 or ECON 2143

HIST 3383, Arkansas History

7. Students wanting to teach social studies in middle school should consult with a middle level adviser in the College of Education and Health Professions.

**Combined Major in Sociology and Anthropology:** 36 hours with a minimum of 15 hours in each subject, to include SOCI 2013, SOCI 3013, SOCI 3303/3301L (or a course in statistics), SOCI 3313, and SOCI 4023 and ANTH 1013, ANTH 1011L, ANTH 1023, ANTH 3023/3021L, and ANTH 4013. Additional courses are to be selected in consultation with a representative of fields concerned.

For a combined major in sociology and African-American studies, see page 116.

For a major in criminal justice, see below.

For a major in social work, see page 150.

For requirements for an M.A. degree in sociology, see the *Graduate School Catalog*.

SEE PAGE 330 FOR SOCIOLOGY (SOCI) COURSES,  
SEE PAGE 270 FOR CRIMINAL JUSTICE (CMJS) COURSES

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## CRIMINAL JUSTICE (CMJS)

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Jerry L. Patnoe

Chair of Studies

211 Old Main

575-3205

Web Site: <http://www.uark.edu/depts/social>

The program in criminal justice is designed to prepare candidates for a variety of entry-level positions in criminal justice and to enable experienced personnel to expand their knowledge and skills. Drawing on a strong interdisciplinary base in the social sciences, the program provides education in the complexities of human behavior and problems of interpersonal relations in an increasingly urbanized America. The overall goal of the program is to enable men and women to contribute to the development and implementation of a fair and effective system of criminal justice.

**Requirements for the B.A. Degree with Major in Criminal Justice:** Minimum of 37 semester hours to include CMJS 2003, CMJS 2053, CMJS 3043, CMJS/SOCI 3203, SOCI 3301L, SOCI 3303, SOCI 3313, minimum of two courses chosen from CMJS/SOCI 3023, SCWK 3233, SOCI 4063, a minimum of one course chosen from CMJS 3003, PLSC 3243, CMJS 3503, SCWK 3533, PLSC 4253, PLSC 4263. Hours to complete the 37 semester hour requirement for the major may be chosen from the following list:

SOCI 3033, American Minorities

PSYC 3093, Childhood and Adolescence

PLSC 3103, Public Administration

SOCI 3193, Race, Class, and Gender in America

SCWK 3193, Human Diversity and Social Work

CMJS 3003, Criminal Law and Society

CMJS 3023, Criminology (Same as SOCI 3023)

SOCI 3223, Social Psychology

SCWK 3233 Juvenile Delinquency

SOCI 3233, Collective Behavior

PLSC 3243, The Judicial Process

ANTH 3443, Criminalistics: Forensic Sciences

CMJS 3503, Criminal Procedures

CMJS 3523, Criminal Investigation

SCWK 3533, Legal Aspects of Social Welfare

SOCI 3723, Deviant Behavior

CMJS 399VH, Honors Course

CMJS 4003, Internship in Criminal Justice

CMJS 4013, Special Topics in Criminal Justice

CMJS 403V, Individual Studies in Criminal Justice

SOCI 4063, Organizations in Society

PHIL 4143, Philosophy of Law

SCWK 4143, Addiction and the Family

SOCI 4163, Extremism

SOCI 4213, Seminar in Violence

PLSC 4253, The Supreme Court and the Constitution

PLSC 4263, The Supreme Court and Civil Rights

For transfer students, a minimum of 24 hours of advanced coursework in the major at the University of Arkansas is required.

For descriptions of courses offered by other departments, see the appropriate sections of this catalog.

**Writing Requirement:** To fulfill the Fulbright College writing requirement, each criminal justice major will submit, prior to graduation, a substantial research or analytical paper, with a grade of 'A' or 'B' from an upper-division criminal justice course (3000-, 4000-, or 5000-level) to their departmental adviser. Satisfactory completion of an honors project or a senior thesis may fulfill this requirement.

**Requirements for Departmental Honors in Criminal Justice:** The Departmental Honors Program in Criminal Justice is an upper-division course of study based on a topic in the area of Criminal Justice. To be eligible for criminal justice honors candidacy, students normally will have completed 28 semester hours and not more than 85 semester hours with a minimum cumulative grade-point average of 3.25. They must take 12 hours (which may include 6 hours of thesis) in Honors Studies. The honors project may be an intensive study of a topic in criminal justice or an empirical research investigation. The candidate is expected to pass an oral examination given by an Honors Council Committee. Projects of extraordinarily high quality may be designated High Honors by the Committee. Successful completion of the requirements will be recognized by the award of the distinction "Criminal Justice Scholar *Cum Laude*" at graduation. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the whole of the candidate's program of honors studies.

SEE PAGE 270 FOR CRIMINAL JUSTICE (CMJS) COURSES

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## STATISTICS (STAT)

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Laurie Meaux

Chair of Studies

301 SCEN

575-3351

- Professors McNew
- Associate Professors Gbur, Mauromoustakos, Meaux
- Assistant Professors Petris, De Oliveira
- Research Associates Duncan, Thompson

**Requirements for a Minor in Statistics:** MATH 2554 and 12 hours of non-cross-listed courses, including 9 hours in courses numbered 3000 and above. A student must notify the department of mathematical sciences of his or her intent to minor.

SEE PAGE 331 FOR STATISTICS (STAT) COURSES

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## ZOOLOGY (ZOOL)

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SEE PAGE 336 FOR ZOOLOGY (ZOOL) COURSES

# Sam M. Walton College of Business

## Dean of the College

301 WCOB  
575-5949

## Undergraduate Programs Office

328 WCOB  
575-4622

## Graduate School of Business

475 WCOB  
575-2851

## Dean

Doyle Z. Williams, Ph.D.  
Louisiana State University

## Associate Dean for Academic Affairs

William P. Curington, Ph.D.  
Syracuse University

## Assistant Dean

David Hyatt, M.B.A.  
University of Arkansas, C.P.A.

## World Wide Web

<http://www.waltoncollege.uark.edu>

**E-Mail: [basucces@walton.uark.edu](mailto:basucces@walton.uark.edu)**

## MISSION STATEMENT

Our mission is to provide an environment of educational excellence in the business disciplines that stimulates learning and innovation consistent with our land-grant heritage.

In our educational, scholarly, and service endeavors, we will value the following:

- Ethics and Professionalism – We believe that organizational practices must be built on an ethical foundation and high standards of professional behavior.
- Excellence – We strive for excellence in all that we do.
- Entrepreneurial Spirit – We value creativity, innovation, and entrepreneurial spirit.
- Collegiality and Community – We believe in working together in a collegial fashion, and we examine situations and ideas from multifaceted and diverse perspectives.

## VISION STATEMENT

The Sam M. Walton College of Business is a nationally competitive college of business that balances student learning experiences with research that serves Arkansas and the world. We connect people with organizations and scholarship with practice.

## ORGANIZATION AND FACILITIES

The Walton College offers degree programs for undergraduate students and for graduate students at both the master's and doctoral levels. The college has been a member of and accredited by AACSB International - The Association to Advance Collegiate Schools of Business since 1931. The accounting program was accredited separately in 1986 at both the bachelor's and master's level. The master's degree in the business administration program was approved in 1963. Accreditation by and membership in that organization signifies commitment by the college to the goals of promoting and actualizing the highest standards of business education.

Walton College is located in two modern buildings designed to be a functional home for the on-campus programs. These attractive facilities house fully equipped classrooms for business classes, eight state-of-the-art computer laboratories for both class and individual use, faculty and administrative offices, an honors program study area with computer access, a Career Development Center, and a large study room equipped for individual as well as group studying.

The library of the college is part of the general University Libraries and is housed in Mullins Library. The business and economics collection comprises approximately 55,000 volumes and makes this library one of the best in the region.

Walton College also operates centers for research, outreach, and



public service. Information about these centers may be found in the University Centers and Research Units section of this catalog. Walton College centers include the following:

- Arkansas Household Research Panel
- Bessie Moore Center for Economic Education
- Center for Business and Economic Research
- Center for Management and Executive Development
- Center for Retailing Excellence
- Information Technology Research Center
- Supply Chain Management Research Center
- Small Business Development Center

## UNDERGRADUATE DEGREE PROGRAMS

Undergraduate students may pursue curricula leading to one of the following degrees: Bachelor of Science in Business Administration (B.S.B.A.), Bachelor of Science in International Business (B.S.I.B.). In each of these degree programs, the pre-business requirements must be completed before students may enroll in upper division business courses. Students in Walton College may pursue an academic minor in the J. William Fulbright College of Arts and Sciences. Walton College also offers a business minor for non-business students. Degree programs and minors are outlined on subsequent pages.

## ADMISSION TO THE SAM M. WALTON COLLEGE OF BUSINESS

All students admitted to the University of Arkansas, Fayetteville, are eligible for admission to the Sam M. Walton College of Business. Students will be required to follow the degree program requirements set forth in the catalog corresponding to the student's first semester in Walton College, not the first semester of enrollment at the University of Arkansas.

## COLLEGE SCHOLARSHIPS

High school graduates who expect to enroll in Walton College are encouraged to make application for scholarships made available to freshmen by individuals, business firms, and organizations. Also available to freshmen, regardless of degree program, are freshmen academic scholarships. Current Walton College students may apply for both college and departmental scholarships beginning in January of each year for the following academic year. Information on these financial awards may be secured from the University Scholarship Office and the Walton College Undergraduate Programs Office.

## HONORS PROGRAM

Walton College honors program consists of two components: the four-year Walton Scholars Program and the Departmental Scholars Program. Students participating in the honors program will be eligible to graduate Cum Laude, Magna Cum Laude, and Summa Cum Laude. Students who do not participate in the honors program are eligible to graduate with distinction, a classification separate from the Cum Laude awards. Honors program students will receive priority for participation in the Arkansas Cooperative Education Program, SAKE, the portfolio management class, and financial support for study-abroad programs. They also have access to an honors study area.

### Eligibility in the Honors Program

Admission will be offered to incoming freshmen with an ACT of 28 or higher and a high school GPA of 3.75. Students are required to maintain a cumulative GPA of 3.50 to remain in the program.

## Requirements for Walton Scholars Program:

1. Complete 17 of 35 University Core hours in honors courses. Completing honors sections of courses in the Fulbright College will fulfill this requirement. MATH 2554 and MATH 2564 also count toward this requirement.
2. Demonstrate proficiency in a foreign language. This requires 0 to 12 hours of course work. Students may demonstrate proficiency by completing the 2013-level course in any foreign language.
3. Complete eight to nine credit hours of honors courses in Walton College to include the following:
  - a. One three-hour college colloquium in a student's major. This is an interdisciplinary course with topics appealing to a wide range of majors. The subject matter changes annually and is targeted to juniors.
  - b. One three-hour departmental colloquium. Each department will offer one departmental colloquium each year. It is designed for seniors.
  - c. A two- to three-hour thesis. The thesis is a major independent writing project and arises from an international study experience, an internship, or working with a professor on research.
4. Complete an alternate honors capstone course WCOB 3016H, Business Strategy and Planning. This is a course emphasizing joint projects with a Walton College corporate partner.

## Requirements for the Departmental Scholars program:

1. Complete six hours of honors courses in the University Core or demonstrate proficiency in a foreign language (as described above).
2. Complete eight to nine hours of honors courses in Walton College to include
  - a. One three-hour college colloquium
  - b. One three-hour departmental colloquium
  - c. A two- to three-hour thesis

## STUDENT ORGANIZATIONS IN WALTON COLLEGE

In addition to the general University student organizations, Walton College Student Ambassadors, Study Abroad Ambassadors, and a Business Dean's Student Advisory Board, there are several college societies open to Walton College students. These include the following:

- Alpha Kappa Psi (business professional)
- American Marketing Association
- Assoc. of Info. Technology Professionals
- Beta Alpha Psi (accounting honorary and professional)
- Beta Gamma Sigma (business honorary)
- Economics Club
- Finance Club
- National Assoc. of Black Accountants
- Omicron Delta Epsilon (economics honorary)
- Human Resource Management Association
- Transportation and Logistics Association

## ACADEMIC REGULATIONS OF WALTON COLLEGE

### Pre-Business Requirements

Students pursuing a degree in Walton College are classified as pre-business with an intended major until all pre-business requirements are fulfilled. The following policies apply to the pre-business program:

To be eligible to enroll in upper-division business courses in Walton College, a student must complete the Walton College computer competency requirement (WCOB 1120) and obtain at least a 2.25 (on a 4.00 scale) overall grade-point average (GPA) in addition to completing the

42 credit hours listed below of pre-business core courses (or their equivalents), also with at least a 2.25 GPA. Further, a student may not have more than three hours of the grade "D" in the courses offered to meet this requirement or the requirement for graduation. The pre-business core courses are as follows:

COMM 1313	ENGL 1023	WCOB 1023
MATH 2053	MATH 2043	WCOB 1033
ECON 2013	WCOB 2023	WCOB 2013
ECON 2023	WCOB 1111	WCOB 2033
ENGL 1013	WCOB 1012	WCOB 2043

Students' records will be evaluated each semester to determine whether a student should be moved to a major, have pre-business classification removed, and assigned an adviser in their major department. After receiving notification that a student has been admitted into his or her major, the student is expected to arrange for a degree check by the Undergraduate Programs Office to ascertain remaining degree requirements.

### Registration in Junior/Senior-Level Walton College Courses

Walton College students must complete the pre-business requirement prior to enrollment in junior- or senior-level courses in Walton College.

Non-degree seeking students and students enrolled in other colleges are subject to the same course prerequisites as students within Walton College. Specific exceptions to this policy must be addressed to the associate dean for academic affairs in Walton College.

**Restrictions on General Education Electives:** Only six hours total of general education electives will be allowed in Physical Education Activity (PEAC) or Dance Education Activity (DEAC) courses.

### Transfer of Credit Policies

In addition to the University policies controlling the granting of credit for course work taken at other institutions, the following policies apply to transfer work applied to any undergraduate business program:

1. Transfer students considering admission to pursue a major in Walton College must have completed the pre-business courses and requirements listed above and have a 2.25 (on a 4.00 scale) cumulative grade-point average in the pre-business courses and in his or her overall grade-point average. Transfer students will be classified as pre-business students until pre-business core requirements have been completed.
2. A pre-business and overall grade point average for courses accepted for transfer by the University of Arkansas will be calculated and used to evaluate the completion of the pre-business requirements by students transferring courses from other institutions.
3. Transfer courses accepted by the University will not be accepted by Walton College for degree purposes unless a grade of "C" or better has been earned in each of these courses.
4. Degree credit will not be granted to Walton College students for any pre-business course taken at another institution while a student is concurrently enrolled during the same semester at the University of Arkansas.
5. A transferred course cannot carry more degree hours than are available in a similar University of Arkansas course. For example, a four-hour principles of accounting course transfers as three degree hours.
6. Business courses completed at the freshman or sophomore level at another institution will not count as equivalents of junior- or senior-level courses offered in Walton College (University of Arkansas), and no transfer credit shall be granted for any such course(s) in Walton College.
7. At least 50 percent of program requirements in business and economics must be taken in residence.

8. All courses within a student's major and business strategy and planning (WCOB 3016) must be taken in residence at the University of Arkansas, Fayetteville.
9. Junior- or senior-level core courses in business and economics may be transferred from a school accredited by AACSB International.
10. Junior- or senior-level core courses taken at a non-AACSB International-accredited, four-year institution must either be repeated or validated by procedures specified and approved by the managing director of undergraduate programs.
11. Junior- or senior-level electives in business and economics taken at a non-AACSB International-accredited, four-year institution may be accepted in transfer as junior/senior business electives.
12. If a student takes courses with different names but with similar content at different institutions or in different colleges within the University of Arkansas, degree credit will be allowed for only one of the courses, for example, principles of economics and agricultural economics.
13. Courses taken at any higher education institution where the course content is remedial are not acceptable for degree credit.
14. The student should be prepared to submit course descriptions, syllabi, or other course-related information for transfer course work if there is any question as to whether Walton College will grant degree credit for such work.
15. Exceptions. All requests for, exceptions to, and variations from the rules, regulations, and requirements of Walton College and the University should be made in writing to the associate dean for academic affairs of Walton College. Consult the Undergraduate Programs Office in Walton College for these requests.

### Course Loads

The normal course load in Walton College is 15 to 17 hours per semester (and six hours per summer term). Students with a 2.75 grade-point average the previous semester may take a maximum of 18 hours. Seniors may take 18 to 19 hours, if required for graduation, during their final semester. Students on academic warning are limited to a maximum course load of 12 hours. University regulations on the number of hours allowed per semester are on page 31.

### Foreign Language Concentration

An undergraduate B.S.B.A. degree-seeking student may elect to substitute 12 hours in a single upper-level foreign language for 12 hours in the junior-senior business elective block of courses for the degree requirements. Students may not present a combination of foreign language and junior-senior business electives to fulfill this requirement.

### Double Major

A student may elect to obtain a double major by completing all required courses for two majors in Walton College (but not in two concentrations within a single major). The minimum hour requirement for a double major is 138 degree credit hours to include all requirements for both majors. If there are courses common to both majors, the department chairs involved will agree upon and specify additional requirements in lieu of the common courses. The junior/senior business elective block is reduced by three hours; however, choice of the junior/senior business electives is restricted to no more than three total hours from each department that offers the two majors. Students who have elected to substitute a foreign language course of study for junior/senior business electives must complete 12 hours of junior/senior language courses.

The student must notify the Undergraduate Programs Office in Walton College of intent to pursue a double major. All requirements for double majors must be completed prior to awarding of a degree.

## Additional Bachelor's Degrees

Students seeking a second bachelor's degree must contact the undergraduate programs office to ascertain specific requirements. Degree candidates must meet the University's general graduation requirements. The University requires that 1) the student take a minimum of 30 semester hours over the requirements for the first degree, and 2) the 30 hours cover a minimum of 36 weeks in residency at the Fayetteville campus. Walton College also requires that the student complete all courses in the pre-business and business core and the major and any additional business requirements (if some of these have been completed on the first degree, they are waived); it is recommended that any additional courses needed to finish the University's 30-hour requirement be junior or senior business electives. The second degree may be taken after the first is awarded, or both degrees may be awarded simultaneously after completion of all requirements for both.

## College Graduation Requirements

- 1. University Requirements.** Degree candidates must meet the following: the University's general entrance requirements, number of credit hours required in residence, and the "requirements for graduation," including the University Core American history, and English proficiency.
- 2. Hour Requirements.** Degree candidates must satisfactorily complete the total number of semester hours specified for the curriculum in courses approved for one of the majors outlined in the succeeding pages. No less than 50 percent of the total credits must be in approved subjects other than business.

**NOTE:** Not all courses offered by the University will be accepted for degree credit by Walton College. Courses falling into this category are ANTH 0003, PHSC 0003, CIED 0003, ENGL 0003, MGMT 1033 and MATH 0003. Developmental courses are defined as 1) any course so designated by the University, and 2) any lower-division course taken after a higher-level course is taken. Credit will not be given for duplicate course work.

- 3. Grade Requirements.** Students may not have more than three hours of the grade "D" in pre-business core course requirements. Each student must have a 2.00 cumulative GPA in each of the following areas:
  - a. All work completed at the University of Arkansas.
  - b. All courses specifically designated for the major.
  - c. All required business core courses and required economics courses.
- 4. General Education Course Work.** A student's general education course work must satisfy University core requirements, additional college/program course-specific requirements, as well as these two area requirements:
  - a. social issues, multicultural environment, and demographic diversity, and
  - b. micro and macroeconomics. If a student has not satisfied these area requirements within the fine arts and/or social sciences areas of the University core, these area requirements must be satisfied through general education electives to allow students to complete degree requirements within the hours indicated above.

Courses that satisfy these area requirements are listed below. Note that many of these courses will also satisfy University core requirements. Where possible, a student should select courses that satisfy both requirements.

### a. Social Issues, Multicultural Environment, and Demographic Diversity

ANTH 1023, Intro to Cultural Anthropology (Univ. core)  
 SOCI 2013, General Sociology (Univ. core)  
 SOCI 2033, Social Problems (Univ. core)

WCIV 1003, Western Civ. I (Univ. core)  
 WCIV 1013, Western Civ. II (Univ. core)  
 GEOG 1123, Human Geography (Univ. core)  
 Any Foreign Language (Univ. core, if 2000-level or above, general education elective otherwise)

### b. Micro/Macro Economics

ECON 2013, Principles of Macroeconomics (business core)  
 ECON 2023, Principles of Microeconomics (business core)

- 5. Residency Requirements.** The senior year's curriculum (last 30 hours) in business must be taken in residence. In addition, the student's major requirements (or the degree equivalent) and WCOB 3016 must be completed in residence. Specifically required junior or senior courses in business or economics must be taken at the University of Arkansas or at an AACSB-accredited school. At least 50 percent of the total hours in business and economics must be taken in residence.
- 6. Correspondence Course Rules.** No more than 18 hours of course work taken by correspondence may apply toward a degree. These 18 hours may not include more than 12 hours of courses in economics or business, and may not include any junior- or senior-level economics or business courses without prior approval of the associate dean for academic affairs.
- 7. Catalog/Curriculum Changes.** Business is a dynamic profession, and the college and department curricula are updated continuously to keep pace with changes in the business world. Students entering under this catalog will be required to comply with such curricular changes to earn their degree. The total number of hours required for the degree, however, may not be increased, and all work completed in accordance with this catalog prior to the curriculum change will be applied toward the student's degree requirements. Furthermore, courses incorporated into the curriculum at a level lower than the one the student has completed are not required for that student unless there are specific prerequisites. Students entering under earlier catalogs are responsible for completing the graduation requirements as published in the catalog in effect when they entered the program. Students having interruptions of their academic programs that exceed two calendar years must complete the requirements published in the catalog in effect when they re-enter the program. Exceptions to the graduation requirements must be approved by the associate dean for academic affairs and appropriate department chair.

## Graduation with Honors

The bachelor's degree *Summa Cum Laude* (with highest honors), *Magna Cum Laude* (with high honors), or *Cum Laude* (with honors) may be conferred only upon those students who have successfully completed the Walton College Honors Program. Both Walton Scholars and Departmental Scholars are eligible for these designations. Students whose cumulative grade-point average place them in the top 10 percent of their graduating class but who have not completed the Honors Program are eligible for the designation "With Distinction" on their official transcript. Among those students completing the Honors Program, the designations *Summa Cum Laude*, *Magna Cum Laude* and *Cum Laude* shall be determined as follows:

- Top 20 percent of students completing the Honors Program:  
*Summa Cum Laude*
- Next 30 percent of students completing the Honors Program:  
*Magna Cum Laude*
- Next 50 percent of students completing the Honors Program:  
*Cum Laude*

No honors degree will be conferred upon a candidate who has not completed at least 50 percent of his or her degree work at the University



of Arkansas or who, in the last four semesters of attendance, has a cumulative grade-point average of less than 3.00 or has received a “D” or “F” in any course in the last semester. Certain other requirements will be outlined on request by the dean of the College.

### Cooperative Education

Cooperative education (co-op) is an academic program that enables students to gain degree-related experience prior to graduation. It is a planned, progressive educational strategy in which the student obtains work experience related to his or her academic major and career goals. Participating students earn academic credit for their work experiences and are always paid by their employers. Co-op students can maintain their status as full-time students while participating in the program, even if their co-op experience requires they spend a semester working full-time.

Walton College students are eligible for co-op credit if they have 1) completed the pre-business core and have obtained at least 60 hours of credit, 2) a cumulative grade-point average of 2.5 or better, and 3) a grade-point average of 2.5 or better for the last full-time term completed. Students may receive one hour of credit per semester for a job that requires 12-19 hours of work per week or two hours of credit per semester for a job that requires 20 or more hours per week. A maximum of six hours of degree credit may be awarded as a junior- senior-level business elective. Full-time students who work 40 hours or more per week in internships approved by the co-op education academic coordinator are eligible for three hours of academic credit per semester, or per full summer, provided they have a minimum GPA of 2.75, as well as having received a GPA of at least 2.75 in the prior full-time semester.

Students may seek either to qualify a job they have found themselves for co-op credit, or they may seek an employment opportunity through the Walton College Career Development Center, WCOB 117. The employment opportunity may be either a full-time, off-campus work assignment that alternates with semesters spent on campus taking courses (an alternating co-op), or it may be a part-time job undertaken concurrently with course work (a parallel co-op). Once a student has been matched with an approved job, the co-op coordinator, the faculty co-op adviser, the student’s work place supervisor, and the student work together to formulate career-related learning objectives for the coming semester of work. These objectives must be in writing and in to the cooperative education coordinator in order for a student to be registered for co-op. At the end of each semester of work, the student is required to submit a three- to five-page paper that re-states the student’s learning objectives for the semester and discusses how the job experience fulfilled the objectives. The student is also required to submit an employer evaluation form, and the work supervisor is asked to submit an evaluation of the student’s work.

For information on participating in Walton College co-op program, a current listing of co-op opportunities, and phone numbers of people with whom you may discuss these opportunities, visit the Cooperative Education home page on the Web at <<http://waltoncollege.uark.edu/coop>>.

## DEGREE REQUIREMENTS OF WALTON COLLEGE

### Bachelor of Science in Business Administration (B.S.B.A.)

The Bachelor of Science in Business Administration degree is offered through an educational program in the business and organizational disciplines intended to prepare individuals to make sustained contributions to organizations and society in a global, diverse and dynamic environment. To achieve this objective the curriculum focuses on developing an individual’s interdisciplinary problem-solving skills, interpersonal and communication skills, ability to adapt to changing technology, spirit of entrepreneurial innovation, and ethical and professional values.

Walton College offers work in the following eight majors for the

B.S.B.A. degree. Some majors have concentrations to allow additional specialization.

1. Accounting (ACCT)
  - i. Concentration I – Business Economics
  - ii. Concentration II – International Economics and Business
2. Business Economics (BECO)
  - i. Concentration I – Business Economics
  - ii. Concentration II – International Economics and Business
3. Finance (FINN)
  - i. Concentration I – Banking
  - ii. Concentration II – Financial Management/Investment
  - iii. Concentration III – Insurance
  - iv. Concentration IV – Real Estate
  - v. Concentration V – Personal Financial Management
4. General Business (GBUS)
5. Information Systems (ISYS)
  - i. Concentration I – Information Systems
  - ii. Concentration II – Information Systems with Area Emphasis
  - iii. Concentration III – Quantitative Analysis
6. Management (MGMT)
  - i. Concentration I – Administrative Management
  - ii. Concentration II – Human Resource Management
  - iii. Concentration III – Small Business Management
7. Marketing (MKTT)
  - i. Concentration I – Retail Marketing
  - ii. Concentration II – Industrial Marketing
  - iii. Concentration III – Marketing Management
8. Transportation (TRNS)

### Requirements for B.S.B.A. Degree

Students pursuing a degree in Walton College are classified as pre-business with an intended major until all pre-business requirements are fulfilled. To enroll in upper-division courses, a student must obtain at least a 2.25 (on a 4.00 scale) overall grade-point average in addition to the completion of all pre-business core courses (or equivalents), also with a minimum 2.25 GPA. Further, a student may not have more than three hours of the grade “D” in the pre-business core courses for admission into the major or for the graduation requirement.

	HOURS
<b>A. University Core Requirements</b>	<b>35</b>
English Composition (two courses)**	6
Finite Mathematics**	3
American History or Government	3
Laboratory Science (two courses with labs)	8
Social Science (three courses)	9
Fine Arts & Humanities (two courses)	6
<b>B. Additional Requirements for Business Students</b>	<b>9</b>
Fundamentals of Communication**	3
Survey of Calculus**	3
Business Social Science (one of the following)	3
PSYC 2003 – General Psychology	
PSYC 3013 – Social Psychology	
PSYC 3023 – Abnormal Psychology	
PSYC 3103 – Cognitive Psychology	
PSYC 4063 – Personality	
PSYC 4073 – Learning	
PSYC 4123 – Perception	
SOC 2013 – General Sociology	
SOC 3033 – American Minorities	
SOC 3223 – Social Psychology	
SOC 3303 – Social Data and Analysis	
SOC 4063 – Organizations in Society	
PLSC 2003 – American National Government	



PLSC 3103 – Public Administration  
 PLSC 3113 – Dynamics of Service Sector Organizations  
 PLSC 3243 – The Judicial Process  
 PLSC 3803 – International Organization  
 PLSC/SOCI 4053 – Political Sociology  
 PLSC 4263 – The Supreme Court and Civil Rights

<b>C. Business Core Courses</b>	<b>33</b>
<b>Lower-Division Requirements</b>	<b>27</b>
WCOB 1120 Computer Competency Requirement	
WCOB 1111 Freshman Business Connections**	1
WCOB 1012 Legal Environment of Business**	2
WCOB 1023 Business Foundations**	3
WCOB 1033 Data Analysis and Interpretation**	3
ECON 2013 Principles of Macroeconomics**	3
ECON 2023 Principles of Microeconomics**	3
WCOB 2013 Markets and Consumers**	3
WCOB 2023 Prod and Delivery of Goods and Services**	3
WCOB 2043 Acquiring and Managing Financial Res**	3
WCOB 2033 Acquiring and Managing Human Res**	3
<b>Upper-Division Requirement</b>	<b>6</b>
WCOB 3016 Business Strategy and Planning	6
<b>D. Major Requirements</b>	<b>24</b>
<b>E. Business Electives</b>	<b>15</b>
<b>F. General Education Electives</b>	<b>16</b>
(no more than 6 hours in PEAC or DEAC)	

**TOTAL REQUIRED FOR BSBA DEGREE 126**

(Total is less than the sum of the categories because some courses count in two categories.)

\*\* **Pre-Business requirement:** These 42 hours must be completed with a GPA of 2.25, an overall GPA of 2.25, and no more than 3 hours of “D” grades before a student is allowed to take upper-division business courses.

In addition to the core courses, each student will complete the required major courses, junior- senior-level business electives, and electives specified by each major.

Each student must have a 2.00 cumulative grade-point average in each of the following areas: all work completed at this University, all courses specifically designated for the major, all required Walton College core and economics courses. Students may not present more than three hours of the grade “D” in the pre-business core courses.

**Bachelor of Science in International Business Degree (B.S.I.B.)**

The Bachelor of Science in International Business degree is intended for students who wish to learn more about the international aspects of business. It provides preparation for a broad range of careers in business, including accounting, management, marketing, economics, information systems, finance, and transportation and logistics. This degree is also well suited for students wishing to continue their studies in law, international affairs, or graduate education in business and economics.

This degree requires completion of the University Core and Walton College Core courses, as well as course work in international business, a single foreign language and an area of study related to that language. In addition, students must select a concentration in one of the following areas: accounting, business economics, information systems, finance, general business, management, marketing, or transportation and logistics.

Students pursuing a degree in the Sam M. Walton College of Business are classified as pre-business with an intended concentration until all pre-business requirements are fulfilled. For admission into the in-

tended concentration, a student must obtain at least a 2.25 (on a 4.00 scale) overall grade-point average, in addition to the completion of all pre-business core courses listed elsewhere in the catalog (or equivalents), also with a minimum 2.25 grade-point average. Further, a student may not have more than three hours of “D” grades in the pre-business core courses for admission into the major or for the graduation requirement.

**Graduation Requirements for the B.S.I.B. Degree**

Each student must have a 2.00 cumulative grade-point average in each of the following areas: all work completed at this University, all courses in the business core, and all designated international business courses/functional concentration/foreign language courses. In addition, students may not present more than three hours of “D” grades in pre-business core courses.

**Course Requirements for the B.S.I.B. Degree**

	HOURS
<b>A. University Core Requirements</b>	<b>35</b>
See description and listing of the University core for the B.S.B.A. degree.	
<b>B. Additional Requirements for Business Students</b>	<b>9</b>
Fundamentals of Communication**	3
Survey of Calculus**	3
Business Social Science (one of the following)	3
PSYC 2003 – General Psychology	
PSYC 3013 – Social Psychology	
PSYC 3023 – Abnormal Psychology	
PSYC 3103 – Cognitive Psychology	
PSYC 4063 – Personality	
PSYC 4073 – Learning	
PSYC 4123 – Perception	
SOCI 2013 – General Sociology	
SOCI 3033 – American Minorities	
SOCI 3223 – Social Psychology	
SOCI 3303 – Social Data and Analysis	
SOCI 4063 – Organizations in Society	
PLSC 2003 – American National Government	
PLSC 3103 – Public Administration	
PLSC 3113 – Dynamics of Service Sector Organizations	
PLSC 3243 – The Judicial Process	
PLSC 3803 – International Organization	
PLSC/SOCI 4053 – Political Sociology	
PLSC 4263 – The Supreme Court and Civil Rights	

<b>C. Business Core Courses</b>	<b>33</b>
<b>Lower-Division Requirements</b>	<b>27</b>
WCOB 1120 Computer Competency Requirement	
WCOB 1111 Freshman Business Connections**	1
WCOB 1012 Legal Environment of Business**	2
WCOB 1023 Business Foundations**	3
WCOB 1033 Data Analysis and Interpretation**	3
ECON 2013 Principles of Macroeconomics**	3
ECON 2023 Principles of Microeconomics**	3
WCOB 2013 Markets and Consumers**	3
WCOB 2023 Prod and Delivery of Goods and Services**	3
WCOB 2043 Acquiring and Managing Financial Res**	3
WCOB 2033 Acquiring and Managing Human Res**	3
<b>Upper-Division Course</b>	<b>6</b>
WCOB 3016 Business Strategy and Planning	6

<b>D. International Business Requirements</b>	<b>15</b>
ECON 4633, International Trade Policy	3
ECON 4643, International Monetary Policy	3
Select 9 hours from the following:	9
FINN 3703, International Finance	
MGMT 4583, International Mgmt.	
MKTT 4833, International Marketing	
TLOG 4643, International Transportation and Logistics	
ECON 4653, Economics of Multinational Enterprises (Other courses may fulfill this requirement if approved by an international business faculty adviser.)	
<b>E. Business Concentration</b>	<b>15</b>
Students must complete one of the following business concentrations:	
<b>Accounting</b>	
ACCT 3013, Accounting View of Economic Events	3
ACCT 3533, Accounting Technology	3
ACCT 3613, Managerial Uses of Accounting Info.	3
ACCT 3723, Financial Reporting and Analysis	3
Plus three hours of a Jr./Sr.-level accounting course	3
<b>Business Economics</b>	
ECON 3133, Macroeconomic Theory	3
ECON 4333, Managerial Economics	3
ECON 4743, Introduction to Econometrics	3
ECON 4653, Economics of Multinational Enterprises	3
Plus three hours of a Jr./Sr.-level economics course	3
<b>Information Systems</b>	
ISYS 2263, COBOL Implementation of MIS	3
ISYS 3293, Systems Analysis and Design	3
ISYS 3393, Business Application Development in the Visual Basic Environment	3
ISYS 4283, Centralized Data Systems	3
Plus three hours of a Jr./Sr.-level information systems course	3
<b>Finance</b>	
FINN 3053, Financial Markets and Institutions	3
FINN 3703, International Finance	3
FINN 3063, Principles of Investments	
OR FINN 3603 Intermediate Financial Management	3
FINN 4233, Financial Policy and Planning OR FINN 4133 Advanced Investments	3
Plus three hours of a Jr./Sr.-level finance course	3
<b>General Business</b>	
Fifteen hours of 3000/4000-level courses in Walton College; no more than nine hours in a single academic area	15
<b>Management</b>	
MGMT 3743, Human Resource Mgmt.	3
MGMT 4583, International Mgmt.	3
Plus nine hours of Jr./Sr.-level management courses	9
<b>Marketing</b>	
MKTT 4133, Marketing Research	3
MKTT 4553, Consumer Behavior	3
MKTT 4533, Marketing Mgmt.	3
MKTT 4833, International Marketing	3
Plus three hours of a Jr./Sr.-level marketing course	3
<b>Transportation and Logistics</b>	
TLOG 3443, Principles of Transportation	3
TLOG 3613, Business Logistics	3

TLOG 4643, International Transportation and Logistics	3
Plus six hours of Jr./Sr.-level transportation courses	6

## **F. Foreign Language Requirements** **12**

For students whose native language is English, 12 hours of University course work are required in a single foreign language — six hours of intermediate language and six hours of upper-division course work in communications and business language, or equivalent. Students who, on the basis of prior knowledge of language, omit one or both courses in the intermediate language sequence — FLAN 2003, FLAN 2013 — may receive degree credit for omitted courses if they validate their higher placement by passing the business language course (or equivalent) with a grade of “C” or above. Students with no previous foreign language training or only rudimentary knowledge of a foreign language will be required to complete up to six hours of elementary language — FLAN 1003, FLAN 2003 — in addition to the 12 hours of language specified above. No degree credit will be given for elementary language courses.

Students whose native language is not English must select a third language or substitute six hours of upper-division English language courses, i.e., speech, writing, or U.S. literature to be selected with the consent of the international business adviser. Those students whose native language is not taught at the University of Arkansas will normally be required to select a third language.

## **G. Area Studies Requirements** **9**

For students taking a foreign language, nine hours of upper-division course work in the J. William Fulbright College of Arts and Sciences are required. Students can satisfy this requirement in one of two ways. One way is to select, with the consent of the international business adviser, courses pertaining to an area of the world (country or region) that is related to the student’s foreign language. These courses could include additional courses in the same foreign language provided the language courses emphasize literature or other cultural topics. For guidance, students should consult the relevant area study concentrations listed in the University catalog under the Fulbright Institute for International Relations. Alternatively, students taking a foreign language can satisfy the area studies requirement by completing a minor in the selected foreign language.

For students who substitute six hours of upper-division English language courses, nine hours of upper-division course work in Fulbright College pertaining to the United States, e.g., history, political science, etc., are required. If the foreign student has significant experience in or knowledge of the United States, the student may propose a six-hour project to substitute for the language requirement, subject to consent of the student’s international business adviser. The project must be justified as contributing to the student’s knowledge and understanding of interdependencies among countries, broadly defined but emphasizing social, political, economic, and humanitarian relationships rather than technical relationships.

## **H. International Experience Requirement**

All students are encouraged to take courses and work abroad. At a minimum, a domestic student must complete the equivalent of one summer term of course work abroad,

or work abroad, or work with the international division of a domestic company as part of their program. Foreign students are encouraged but not required to seek job experience in a company located in a country related to their foreign language requirement.

### **Total Degree Requirements 125**

(Total is more than the sum of the categories because some courses count for multiple requirements.)

### **Clarifying Notes on Degree Requirements**

1. Courses that are required in either Walton College or the international business core and also are required in one of the business concentrations cannot be used to satisfy both requirements. For example, students who take FINN 3703 to satisfy the finance concentration requirements cannot also use it to satisfy the international business requirements.

2. Students who select ECON 2013 and ECON 2023 to partially satisfy the social science bloc and FLAN 2003 to partially satisfy the fine arts and humanities bloc of the University Core Requirements can complete the degree with 125 hours. Students selecting other courses to satisfy these requirements will have longer programs.

### **Minors in the J. William Fulbright College of Arts and Sciences**

Students in Walton College may pursue an academic minor in the J. William Fulbright College of Arts and Sciences. Academic minors usually consist of 15 to 18 hours of course work. The available minors and course requirements are specified in the Fulbright College section of this catalog. Students must notify the Undergraduate Programs Office in Walton College of their intention to pursue a minor as early as possible. Walton College will certify that the requirements of the minor have been satisfied by graduation and, with the assistance of the Fulbright College, will advise students on the requirements to complete a minor. The minor will be designated on the student's transcript.

Courses that are part of the University Core Requirements or the Additional General Education Requirements or any other non-business course that is part of a student's course of study may also be counted for credit in a minor. For example, ANTH 1023, Introduction to Cultural Anthropology, is a concentration in the B.S.B.A. social science bloc and can also be used to satisfy the requirements of the anthropology minor. Other courses in a minor can be counted as general education electives. Walton College economics majors in the business economics concentration or the international economics and business concentration may not obtain a Fulbright College minor in economics.

### **Business Administration Minors for Non-Business Students**

To facilitate students outside Walton College in obtaining knowledge that will assist them in making sustained contributions to organizations and society in a global, diverse, and dynamic environment, Walton College offers a business minor. The minor requires completion of a minimum of 21 required hours of study (including equivalencies) with at least 50 percent of the courses applied toward the minor taken in residence. Each student must have a 2.00 cumulative grade-point average in the courses offered for the minor.

All students seeking a business minor are required to complete the Walton College computer competency requirement (WCOB 1120) and the following courses:

ECON 2143, Basic Economics Theory and Practice  
WCOB 1023, Business Foundations  
WCOB 1033, Data Analysis and Interpretation or equivalent

In addition, students must select and complete one of the following concentrations:

#### **Concentration 1 – General Business**

Select 12 hours from the following courses (at least 6 hours must be at the 3000 or 4000 level).

WCOB 1012, Legal Environment of Business  
WCOB 2013, Markets and Consumers  
WCOB 2023, Production and Delivery of Goods and Services  
WCOB 2033, Acquiring and Managing Human Resources  
WCOB 2043, Acquiring and Managing Financial Resources  
Plus any other 3000- or 4000-level Walton College course

#### **Concentration 2 – Accounting**

ACCT 3013, Accounting View of Economic Events  
ACCT 3613, Managerial Uses of Accounting Info  
Plus an additional six hours selected from the following:  
ACCT 3533, Accounting Technology  
ACCT 3723, Financial Reporting and Analysis  
ACCT 3843, Fundamentals of Taxation

#### **Concentration 3 – Information Systems (Option A or B)**

A. Students desiring a general business computing area of emphasis must complete the following:  
ISYS 2232, Bus Info Systems (or equivalent)  
ISYS 3333, Info Systems Management  
ISYS 3253 Business Data Communications  
ISYS 3373, End-User Computing  
ISYS 3533, Developing Multimedia Applications

B. Non-business computing majors desiring a business systems analysis and decision support area of emphasis must complete the following:  
ISYS 2263, COBOL Implementation of MIS  
ISYS 3293, Systems Analysis and Design  
ISYS 3333, Information Systems Management  
Plus one course from the following:  
ISYS 3283, Advanced COBOL  
ISYS 3253, Business Data Communications  
ISYS 3373, End User Computing  
ISYS 3393, Business Application Development in the Visual Basic Environment  
ISYS 4253, Business Systems Simulation  
ISYS 3533, Developing Multimedia Applications

#### **Concentration 4 – Business Economics**

ECON 4333, Managerial Economics  
Plus an additional nine hours of 3000- or 4000-level business economics courses.

#### **Concentration 5 – International Business**

Select 12 hours from the following:  
ECON 3833, International Trade  
ECON 3843, Economic Development  
ECON 4533, Comparative Economic Systems  
ECON 4633, International Trade Policy  
ECON 4643, International Monetary Policy  
ECON 468V, International Economics and Business Seminar  
FINN 3703, International Finance  
MGMT 4583, International Management  
MKTT 4833, International Marketing  
TLOG 4643, International Transportation and Logistics

#### **Concentration 6 - Management**

MGMT 3563, Managerial Concepts and Organizational Behavior  
Plus an additional nine hours of 3000- or 4000-level management courses (except WCOB 3016)



**Concentration 7 - Marketing**

MKTT 3433, Principles of Marketing  
 Plus an additional nine hours selected from the following:  
 MKTT 3533, Promotional Strategy  
 MKTT 4033, Selling and Sales Mgmt.  
 MKTT 4133, Marketing Research  
 MKTT 4553, Consumer Behavior  
 MKTT 4833, International Marketing  
 MKTT 4933, Retail Marketing Strategy  
 MKTT 4943, Retail Buying and Merchandise Control  
 TLOG 3613, Business Logistics

**Concentration 8 - Transportation and Logistics**

TLOG 3443, Principles of Transportation  
 TLOG 3613, Business Logistics  
 Plus an additional six hours selected from the following:  
 TLOG 3623, Purchasing and Inventory Systems  
 TLOG 4633, Transportation Carrier Management  
 TLOG 4643, International Transportation and Logistics  
 TLOG 4653, Transportation and Logistics Strategy

In addition to the above course requirements, non-business, degree-seeking students working toward a minor should note the following:

1. Students who elect to obtain a business minor must provide written notice of their intent to the dean's office of the college in which they are receiving a degree. This notice and all requirements for the business minor must be completed prior to the awarding of the student's undergraduate degree.

2. Business minor students must complete all 1000- and 2000-level courses required for the business minor and be a junior- or senior-level student to enroll in 3000- or 4000-level business courses.

3. All specific course prerequisites must be met. Although business minor students are not required to satisfy the entire pre-business core, they must complete the required courses and any other prerequisite course specified prior to enrolling in a 3000/4000-level course.

4. ECON 2143 will substitute for ECON 2013/2023 for prerequisite purposes. In addition, students who take both ECON 2013 (Macroeconomics) and ECON 2023 (Microeconomics) will satisfy the economics requirements of the minor.

5. Business minor students are ineligible to take WCOB 3016, Business Strategy and Planning.

6. Non-business students may substitute equivalent courses for the Walton College computer competency requirement. All equivalencies must be approved by the associate dean for academic affairs.

**GRADUATE STUDIES**

The University of Arkansas offers the following advanced degrees in business: Master of Accountancy, Master of Business Administration, Master of Arts in Economics, Master of Transportation and Logistics Management, Master of Information Systems, Doctor of Philosophy in Business Administration, and Doctor of Philosophy in Economics.

For further information about these programs and requirements for admission, see the *Graduate School Catalog* or write to the associate dean for academic affairs, Graduate School of Business, 475 WCOB.

## Departments, Degree Programs and Courses

**ACCOUNTING (ACCT)**

Karen V. Pincus  
 Department Chair and S. Robson Walton Chair in Accounting  
 401 WCOB  
 575-4051

- Doris M. Cook Chair in Accounting and Professor Callahan
- S. Robson Walton Chair in Accounting and Professor Pincus
- Sam M. Walton Leadership Chair and Professor Williams
- Walter B. Cole Chair in Accounting Professor Wright (W.)
- Ralph McQueen Chair of Accounting Associate Professor Bouwman
- Associate Professor and Nolan G. Williams Lecturer in Accounting Thomas
- Associate Professors Gist, West
- Assistant Professors Mosebach (M.), Smith
- Clinical Associate Professor Leflar (C.)
- Instructors Caldwell, Schroeder, Shook, Whitmore

The mission of the department of accounting is to cultivate an environment of educational excellence. We do so by pursuing the following endeavors:

- Providing a learning environment in which students interact with others to identify and solve accounting and business problems.
- Developing and disseminating knowledge that has the potential for significant impact on accounting, business, and education.
- Interacting with the accounting profession, the business and academic communities, and the community at large.

The department of accounting offers an undergraduate degree program in accounting and graduate programs at both the master's and doctoral levels. The department's programs are accredited by the AACSB – The International Association for Management Education, which ensures quality and promotes excellence and continuous improvement in undergraduate and graduate education.

A major in accounting is preparation for success in the business world. Every business needs accounting help, whether it is the largest retail company in the world, a small family-owned enterprise, an agency for the homeless, or a musical group touring the country. The accounting major provides an excellent foundation for a variety of careers.

For example, the professional public accountant provides auditing and accounting services to client business and non-business organizations in a variety of industries. A management accountant works for a particular organization in its finance and operations areas or becomes part of the management team. Some accountants are employed by non-profit organizations such as the American Cancer Society, state and local governments or government agencies like the FBI. Other accounting graduates are self-employed in a variety of professions or businesses, and some continue in graduate school to prepare for teaching careers.

Professional examinations, such as the Certified Public Accountant (CPA) or Certified Management Accountant (CMA) examinations, are governed by the organizations that administer the exam. Students should see the accounting department upon enrollment in the University of Arkansas for information relative to the professional exams.

The education objective at the undergraduate level is to provide an environment in which students learn skills necessary to become professional accountants, including information development and distribution; knowledge of accounting, auditing, and tax; knowledge of business and society; communication skills; analytical and decision-making skills; leadership; and professionalism.



## Accounting Major Requirements

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157.	
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the Major</b>	24
ACCT 3013, Accounting View of Economic Events	3
ACCT 3533, Accounting Technology	3
ACCT 3613, Managerial Uses of Accounting Info	3
ACCT 3723, Fin. Reporting and Analysis	3
ACCT 3843, Fundamentals of Taxation	3
Choose any two of the three courses below:	
ACCT 4673, Product, Project and Service Costing	3
ACCT 4753, Generally Accepted Accounting Principles	3
ACCT 4963, Operational Auditing	3
<b>Collateral Requirement:</b>	
ISYS 3333, Info Systems Management	3
<b>Junior- senior-level electives within Walton College</b> (Only three hours are permitted within major field)	15
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126
<b>NOTE:</b> Selection of electives should be made in consultation with academic advisers. Students planning on taking professional examinations should ascertain course requirements by examining authorities. Successful completion of a Master of Accountancy Degree from the University of Arkansas will qualify a student to take the CPA examination in Arkansas. B.S.B.A. graduates would need additional accounting hours and other courses amounting to a total of 150 semester hours to sit for the CPA exam in Arkansas.	

SEE PAGE 248 FOR ACCOUNTING (ACCT) COURSES

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## BUSINESS LAW (BLAW)

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Karen V. Pincus  
Accounting Department Chair  
401 WCOB  
575-4051

- Associate Professor Norwood
- Instructors Greenhaw, Lawrence, Leflar (M.), Wright (M.)

SEE PAGE 261 FOR BUSINESS LAW (BLAW) COURSES

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## ECONOMICS (ECON)

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Joseph Ziegler  
Department Chair  
402 WCOB  
575-ECON (3266)

- Phillips Petroleum Company Chair of International Business and Economics Distinguished Professor Murray
- Professors Britton, Curington, Dixon, Gay, McKinnon, Ziegler
- Adjunct Professor Millar
- Lewis E. Epley Jr. Professorship Associate Professor Ferrier
- Associate Professors Farmer, Horowitz
- Assistant Professors Deck, Kali, Mendez
- Clinical Associate Professor Stapp
- Visiting Assistant Professors Collins, Littrell

The department of economics offers two concentrations within the business economics major:

- 1) business economics
- 2) international economics and business.

The concentration in business economics is intended for those students who are interested primarily in business, but at the same time have a desire to understand the more advanced tools of economic analysis. Such a background is excellent preparation for careers in corporate research and planning, as well as careers with government and regulatory agencies, for graduate study in business and economics, and for law school. Students who want to pursue an advanced degree in business economics can, with appropriate planning, complete a master's degree at the University of Arkansas within 12 months after receiving a B.S.B.A. degree. Please see the economics department chair for more information.

The international economics and business concentration is intended for students who wish to learn more about the international aspects of economics and business. It provides preparation for a broad range of careers in business, including management, marketing, and finance.

It is strongly recommended that economics majors who plan to continue their studies at the graduate level take two semesters of calculus (MATH 2554 and MATH 2564) and linear algebra (MATH 3083). These courses will substitute for the math courses required within Walton College core (MATH 2043 and MATH 2053).

## Business Economics Concentration

The major in Business Economics requires 24 hours of major and collateral courses in the discipline as well as satisfying the other requirements for the B.S.B.A. degree. A maximum of 27 hours is allowed in a WCOB major or discipline field of study (i.e., core, major, electives) unless the extra course are part of an interdisciplinary minor or collateral track. See an advisor for selection of courses.

The courses required for the business economics concentration include those required in Walton College and Fulbright College. In addition, 15 hours of specified courses (listed below) are required:

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157.	
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the concentration</b>	24
ECON 3033, Microeconomic Theory	3
ECON 3133, Macroeconomic Theory	3
ECON 4033, History of Economic Thought	3
ECON 4333, Managerial Economics	3
ECON 4743, Intro to Econometrics	3
9 hours of ECON 3000/4000 and/or collateral courses	9
<b>Junior- senior-level electives within Walton College</b> (Only six hours are permitted within major field of economics)	15
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126

## International Economics and Business Concentration

The major in International Economics requires 24 hours of major and collateral courses in the discipline as well as satisfying the other requirements for the B.S.B.A. degree. A maximum of 27 hours is allowed in a WCOB major or discipline field of study (i.e., core, major, electives) unless the extra course are part of an interdisciplinary minor or collateral track. See an advisor for selection of courses. The courses required for the international economics and business concentration include those required in Walton College and Fulbright College. In addition, 18 hours of economics and business courses, nine hours of upper-division courses in the Fulbright College, and six hours of a single foreign language at the intermediate level or above, and three hours at the upper-division level in business communications, or equiva-

lent, in the same foreign language are specified. Any student whose minimum six-hour requirement includes an upper-division course may choose to include business communications among the six hours of required university course work in the foreign language.

(Students who need elementary-level language course work may apply ECON 2013 and 2023 in the social science area of the University Core, and the elementary language credits will apply to the general education or free elective area.)

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157.	
<b>General Education Electives</b>	6
<b>Area Study:</b> Specifically required upper-division courses in Fulbright College (Students must select, with the consent of their academic adviser, nine hours of upper-division course work in an area of the world [country or region] that is related to the foreign language. This course work could include additional courses in the same foreign language. To be included as an area study upper-division language, courses should emphasize literature or other cultural topics.)	9
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the concentration</b>	18
ECON 3033, Microeconomic Theory	3
ECON 3133, Macroeconomic Theory	3
ECON 4633, International Trade Pol.	3
ECON 4643, International Monetary Policy	3
<b>International Business and ECON electives</b>	6
<b>Junior- senior-level electives within Walton College</b> (Only three hours are permitted within major field of economics)	6
<b>Total Walton College Requirements</b>	57
<b>Total Degree Requirements</b>	126

SEE PAGE 278 FOR ECONOMICS (ECON) COURSES

**FINANCE (FINN)**

Wayne Y. Lee  
 Department Chair and Alice L. Walton Chair in Finance  
 302 WCOB  
 575-4505

- Arkansas Bankers Association and Bellamy Chair of Banking and Professor Dominick
- Alice L. Walton Chair in Finance and Professor Lee
- Dillard Chair of Corporate Finance and Professor Millar
- Harold A. Dulan Finance Chair in Capital Formation and Professor Liu
- Associate Professors Hearsh, Perry
- Assistant Professors Jandik, Kruse, Rennie
- Clinical Assistant Professor Carter
- Instructors Driver, Risk

The academic mission of the department of finance is to provide an educational experience that provides the following:

- stimulates student learning through open dialogue and informative discourse both inside and outside the classroom;
- actively engages students in their own learning through problem-based casework, participation in real-world business laboratories, and/or internships in the financial community; and
- prepares students to successfully meet the rigors of the challengingly diverse career opportunities in finance.

**Finance Major**

Students who elect to major in finance can choose from one of five concentrations: banking; financial management/investment; insurance; real estate, and personal financial management. This choice should reflect the student's primary career focus and electives listed in other finance concentrations should be used to complement the coursework in the chosen concentration. Careers in finance that are analytically oriented will generally require proficiency in accounting, economics, and quantitative methods. In contrast, careers in finance that are sales or management oriented will generally require marketing and management skills. Finance majors are strongly encouraged to consult with departmental faculty advisers and/or the department chair in developing their curriculum.

**Finance Major Requirements with Concentrations**

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157.	
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Courses Required in All Concentrations</b>	24
Choose any three of the four courses below:	
FINN 3053, Financial Markets and Institutions	3
FINN 3063, Principles of Investments	3
FINN 3603, Intermediate Financial Management	3
FINN 3703, International Finance	3
<b>NOTE:</b> FINN 3603 Intermediate Financial Management and FINN 3102 Financial Modeling are pre-requisites for FINN 4233 Financial Policy and Planning; FINN 3063 Principles of Investments and FINN 3102 Financial Modeling are pre-requisites for FINN 4133 Advanced Investment and FINN 4143 Portfolio Management I.	
	HOURS
<b>Concentration I: Banking</b>	
FINN 3133, Commercial Banking	3
FINN 4313, Advanced Commercial Bank Management	3
FINN 3102, Financial Modeling	2
ACCT 3013, Accounting View of Economic Events	3
ACCT 3723, Financial Reporting and Analysis	3
<b>Concentration II: Financial Management/Investment</b>	
FINN 3102, Financial Modeling	2
ACCT 3013, Accounting View of Economic Events	3
ACCT 3723, Financial Reporting and Analysis	3
Plus any one of the three courses below:	
FINN 4133, Advanced Investment	3
FINN 4233, Financial Policy and Planning	3
FINN 4143, Portfolio Management I	3
FINN 4163, Fixed Income Securities I	3
<b>Concentration III: Insurance</b>	
FINN 3623, Risk Management	3
FINN 4733, Life/Health Insurance I	3
FINN 4833, Property/Casualty Ins I	3
<b>Concentration IV: Real Estate</b>	
FINN 3933, Real Estate Principles	3
FINN 4413, Real Estate Investment and Appraisal	3
FINN 4433, Real Estate Finance	3
<b>Concentration V: Personal Financial Management</b>	
FINN 3003, Personal Financial Management	3
FINN 3063, Principles of Investments	3
FINN 3623, Risk Management	3
FINN 3843, Fundamentals of Taxation	3
FINN 4013, Seminar in Financial Planning	3
FINN 4733, Life and Health Insurance	3
1 - 6 hours FINN 3000/4000 and/or collateral courses	1-6

<b>Junior- senior-level electives within Walton College</b> (Only six hours are permitted within finance)	15
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126

SEE PAGE 288 FOR FINANCE (FINN) COURSES

## INFORMATION SYSTEMS (ISYS)

Fred Davis

Department Chair and David D. Glass Chair in Information Systems

204 WCOB

575-4500

- David D. Glass Chair in Information Systems and Professor Davis (F.)
- Professors Cronan, Douglas, Glorfeld, Jones (T. W.)
- Associate Professor and Edwin and Karlee Bradberry Endowed Chair Hardgrave
- Associate Professor Aloysius
- Assistant Professors Armstrong (D.), McKinney, O'Leary-Kelly (S.), Riemenschneider, Wilson, (D).
- Clinical Professor Doke
- Clinical Assistant Professor Renwick
- Instructors Alguire, Armstrong (K.), Bristow, Brown (N.), Woodbury
- Executive in Residence Schmidt

The curriculum in information systems is designed to prepare graduates for careers in solving business problems with applications of computer technology. For students pursuing a different major, the curriculum offers particular topics within information systems and other quantitative areas to supplement the major.

The information systems major divides into two information systems concentrations and one quantitative analysis concentration. Students electing an information systems major can, in consultation with the departmental adviser, intermingle courses in the concentrations to best serve the student's career objectives. Those planning to engage in information systems as a career immediately after college should elect an information systems concentration, while those contemplating other career plans might consider the quantitative analysis and business statistics concentration.

### Information Systems Major Requirements

The major in Information Systems requires 24 hours of major and collateral courses in the discipline as well as satisfying the other requirements for the B.S.B.A. degree. A maximum of 27 hours is allowed in a WCOB major or discipline field of study (i.e., core, major, electives) unless the extra course are part of an interdisciplinary minor or collateral track. See an Information Systems advisor for selection of courses.

#### Concentration I: Information Systems

Students in the computer information systems concentration may choose to pursue an object-oriented development emphasis by taking ISYS 4333 and ISYS 4373 as their two allowed ISYS electives.

**NOTE:** Course requirements in the Information Systems concentration total 21 credit hours. Because of prerequisites, students should allow two full years (24 months) to complete this coursework. Prerequisites will be strictly enforced.

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157. Programming I (CSCE 1023/1021) is recommended as a general education elective.	
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the Concentration</b>	24

ISYS 2263, COBOL Implementation of MIS	3
ISYS 3293, System Analysis and Design	3
ISYS 3393, Business Applications in Visual Basic	3
ISYS 4283, Centralized Data Systems	3
ISYS 4363, Business Application Systems Development	3
Select any six hours from the following:	
ISYS 3253, Business Data Communications	3
ISYS 3283, Advanced COBOL	3
ISYS 3373, End User Computing	3
ISYS 3533, Developing Multimedia Applications	3
ISYS 4253, Business Systems Simulation	3
ISYS 4333, Object Oriented Seminar	3
ISYS 4373, Object Oriented Programming	3
3 hours ISYS 3000/4000 and/or collateral courses	3

<b>Junior- senior-level electives within Walton College</b> (Only three hours are permitted within major field of ISYS)	15
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126

#### Concentration II: Information Systems with Area Emphasis

Complete the requirements for a B.S.B.A. degree as listed on page 157.

<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the concentration</b>	30
ISYS 2263, COBOL Implementation of MIS	3
ISYS 3293, System Analysis and Design	3
ISYS 3393, Business Applications in Visual Basic	3
ISYS 4283, Centralized Data Systems	3
ISYS 4363, Business Applications Systems Development	3
<b>Area Emphasis – Accounting:</b>	
ACCT 3013, Accounting View of Economic Events	3
ACCT 3533, Accounting Technology	3
ACCT 3613, Managerial Uses of Acct. Inf.	3
ACCT 3723, Fin. Reporting Analysis	3
ACCT 4673, Product, Project and Service Costing	3
Junior/senior level electives within Walton College	11
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126

#### Concentration III: Quantitative Analysis

Complete the requirements for a B.S.B.A. degree as listed on page 157.

<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the Concentration</b>	24
ISYS 3133, Statistical Analysis	3
ISYS 3413, Quant Managerial Meth I	3
Select any nine hours from the following:	
ISYS 3253, Business Data Communications	3
ISYS 3283, Advanced COBOL	3
ISYS 4253, Business Systems Simulation	3
ISYS 4333, Object-Oriented Seminar	3
ISYS 4423, Quantitative Managerial Methods II	3
ECON 4733, Quantitative Economic Analysis	3
ECON 4743, Introduction to Econometrics	3
STAT 4033, Nonparametric Stat Meth	3
9 hours ISYS 3000/4000 and/or collateral courses	9
<b>Junior- senior-level electives within Walton College</b> (Only six hours are permitted within major field of ISYS)	11-15
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126

SEE PAGE 301 FOR INFORMATION SYSTEMS (ISYS) COURSES



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**MANAGEMENT (MGMT)**


---

Daniel C. Ganster  
 Department Chair and Charles C. Fichtner Chair in Management  
 402 WCOB  
 575-6216

- Charles C. Fichtner Chair in Management and Professor Ganster
- Raymond F. Orr Chair and Professor Gupta
- Professors O'Leary-Kelly (A.), Todd, White
- Associate Professors Delery, Ellstrand, Johnson, Reeves
- Assistant Professor Anand

Management is the force responsible for directing organizations toward goals or objectives. Therefore, the management curriculum focuses on the nature and capabilities of human and other resources, as well as how the manager plans, organizes, staffs, coordinates, and evaluates those resources in an organization and its environment. The study of management prepares men and women for positions of leadership in profit and nonprofit organizations of all sizes. Management majors gain insight and skill needed for careers as professional managers or as self-employed entrepreneurs. These skills include: technical knowledge, communicative capacity, human understanding, and conceptual and problem-solving ability. Two majors are offered in the management department. They include management and general business. Both majors are described below.

### Management Major

Students majoring in management may choose one of three concentrations. These concentrations include administrative management, human resource management, and small business and entrepreneurship. Three hours of course work in Human Resource management are required of all management majors. An additional 15 hours of course work is required in each management concentration.

The administrative management concentration offers students a concentration of study that will provide them with a broad management background. Students will acquire knowledge that will prepare them for positions in general management.

The human resource management concentration is designed to prepare students for careers in human resource-related occupations including personnel management. Among issues and areas addressed are management-employee relations, quality of work life, compensation and other reward systems, organizational staffing, and training and development. The human resource management track emphasizes the importance of integrating individual goals and organizational objectives.

The small business and entrepreneurship concentration is suggested for students who are interested in starting and/or operating a small business or independent company after graduation. This program offers students an opportunity to learn about and work directly with small business firms. The small business and entrepreneurship concentration provides excellent preparation for students wishing to obtain a highly integrated view of business operations.

### Management Major Requirements

The major in management requires 24 hours of major and collateral courses in the discipline as well as satisfying the other requirements for the B.S.B.A. degree. A maximum of 27 hours is allowed in a WCOB major or discipline field of study (i.e., core, major, electives) unless the extra course are part of an interdisciplinary minor or collateral track. See a management adviser for selection of courses.

Complete the Requirements for a B.S.B.A. degree as listed on page 157.

<b>Total General Education</b>	60
<b>College Core Requirements</b>	33
<b>Courses Required in All Concentrations</b>	24

MGMT 3743, Human Resource Management

#### Concentration I: Administrative Management

Select 15 hrs from the following:

MGMT 3633, Applied Managerial Problem Solving	3
MGMT 3643, Team Management	3
MGMT 3933, Entrepreneurship/New Venture	3
MGMT 4103, Special Topics	3
MGMT 4203, Understanding Complex Organizations	3
MGMT 4403, Total Quality Management	3
MGMT 4433, Small Enterprise Management	3
MGMT 4533, Labor Legislation	3
MGMT 4583, International Management	3
MGMT 4943, Organizational Staffing	3
MGMT 4953, Organizational Rewards/Compensation	3
MGMT 4993, Entrepreneurship Practicum	3
ECON 4333, Managerial Economics	3
ECON 3533, Labor Economics	3

#### Concentration II: Human Resource Management

MGMT 4943, Organizational Staffing	3
MGMT 4953, Orgn Rewards/Compensation	3

Select nine hours from the following:

MGMT 3633, Applied Managerial Problem Solving	3
MGMT 3643, Team Management	3
MGMT 3933, Entrepreneurship/New Venture	3
MGMT 4103, Special Topics	3
MGMT 4203, Understanding Complex Organizations	3
MGMT 4403, Total Quality Mgmt.	3
MGMT 4433, Small Enterprise Mgmt.	3
MGMT 4533, Labor Legislation	3
MGMT 4583, International Mgmt.	3
MGMT 4993, Entrepreneurship Practicum	3
ECON 4333, Managerial Economics	3
ECON 3533, Labor Economics	3

#### Concentration III: Small Business and Entrepreneurship

MGMT 3933, Entrepreneurship/New Venture	3
MGMT 4433, Small Enterprise Mgmt.	3

Select nine hours from the following:

MGMT 3633, Applied Managerial Problem Solving	3
MGMT 3643, Team Management	3
MGMT 4103, Special Topics	3
MGMT 4203, Understanding Complex Organizations	3
MGMT 4403, Total Quality Mgmt.	3
MGMT 4533, Labor Legislation	3
MGMT 4583, International Mgmt.	3
MGMT 4943, Organizational Staffing	3
MGMT 4953, Orgn Rewards/Compensation	3
MGMT 4993, Entrepreneurship Practicum	3
ACCT 3613, Managerial Uses of Accounting Information	3
MKTT 4933, Retail Marketing Strategy	3
9 hours MGMT 3000/4000 and or collateral courses	9

#### Junior- senior-level electives within Walton College

(Only six hours are permitted within Management)	15
<b>Total College Requirements</b>	60
<b>Total Degree Requirements</b>	126



## General Business Major

General Business is the broadest major in Walton College. This program provides the student exposure to all facets of the business process. Maximum flexibility is retained by the student. At the same time, careful use of general and junior/senior business electives allows the student to concentrate additional course work in one or more selected functional areas. General business also may be particularly valuable to students planning to pursue a master's (M.B.A.) degree.

## General Business Major Requirements

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157.	
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Course Requirements in the Major</b>	24
Select one from each of the following six groups. Sequencing of courses will be determined by choices made.	
<b>Group 1</b>	
MGMT 3743, Human Resource Mgmt.	3
MGMT 3633, Applied Managerial Problem Solving	3
MGMT 3643, Team Management	3
<b>Group 2</b>	
ACCT 3013, Accounting View of Economic Events	3
ACCT 3613 Mgrl. Uses of Acctg. Inf.	3
ACCT 3533, Accounting Technology	3
ACCT 3723 Financial Reporting and Analysis	3
<b>Group 3</b>	
ISYS 3133, Statistical Analysis	3
ISYS 3373, End User Computing	3
ISYS 3413, Quant Managerial Methods I	3
<b>Group 4</b>	
ECON 3533, Labor Economics	3
ECON 3833, International Trade	3
ECON 4333, Managerial Economics	3
<b>Group 5</b>	
FINN 3053, Fin Markets/Institutions	3
FINN 3063, Principles of Investments	3
FINN 3623, Risk Management	3
FINN 4233, Financial Policy/Planning	3
<b>Group 6</b>	
MKTT 3533, Promotional Strategy	3
MKTT 4553, Consumer Behavior	3
MKTT 4933, Retail Marketing Strategy	3
6 hours 3000/4000 business courses and/or collateral courses	6
<b>Junior- senior-level electives within Walton College</b> (Only three hours are permitted in Management and no more than six hours permitted in any of the other departments.)	15
<b>Total Walton College Requirements</b>	60
<b>Total Degree Requirements</b>	126

SEE PAGE 311 FOR MANAGEMENT (MGMT) COURSES

## MARKETING AND LOGISTICS (MKTL)

Thomas D. Jensen  
Department Chair  
302 WCOB  
575-4055

- Wal-Mart Chair of Marketing and Professor Burton
- Wal-Mart Lecturer in Retailing and Professor Jensen
- R. A. and Vivian Young Chair and University Professor Kurtz
- Oren Harris Chair of Transportation Professor Ozment
- Associate Professors Ashton, Creyer, Gentry, Kopp, Murray, Rapert, Stassen, Waller
- Assistant Professor Mendoza
- Research Assistant Professor Milatovic
- Instructor Cole

The department of marketing and logistics offers two majors:  
1) marketing  
2) transportation and logistics.

Descriptions of the marketing major and courses follow. The transportation and logistics major is described in the next section.

### Marketing Major

The major in marketing requires 24 hours of major and collateral courses in the discipline as well as satisfying the other requirements for the B.S.B.A. degree. A maximum of 27 hours is allowed in a WCOB major or discipline field of study (i.e., core, major, electives) unless the extra course are part of an interdisciplinary minor or collateral track. See a marketing advisor for selection of courses.

The major in marketing is designed to prepare students for careers involving product planning, distribution, promotion, and pricing strategies in profit or nonprofit organizations. In addition to a broad overview of the marketing functions within organizations, students are provided with knowledge and skills in consumer behavior, marketing research, and strategic marketing. Students majoring in marketing are actively subjected to problem-solving situations, both domestic and international, where a variety of contemporary tools are employed to stimulate the strategic decision-making process. Supportive disciplines with which the marketer should be familiar include psychology, sociology, accounting, economics, statistics, quantitative analysis, and research methodology.

The marketing major has three concentrations to select from: marketing management, retail marketing, and industrial marketing. The marketing management concentration is intended to provide students with broad knowledge and skills in marketing applicable to industry. The retail marketing concentration prepares students for marketing careers in the retail industry. The industrial concentration prepares students for marketing careers in the industrial sector with a special emphasis on personal selling and sales management.

### Marketing Major Requirements

	HOURS
Complete the requirements for a B.S.B.A. degree as listed on page 157.	
<b>Total General Education</b>	60
<b>Walton College Core Requirements</b> (See page 157)	33
<b>Courses Required in All Concentrations</b>	24
MKTT 4133, Marketing Research	3
MKTT 4553, Consumer Behavior	3
MKTT 4533, Marketing Management	3
MKTT Elective	3

Majors must select one of the following concentrations and must complete six hours within the elected concentration.

**Concentration I: Marketing Management**

Select six hours from the following:

MKTT 3533, Promotional Strategy	3
MKTT 4033, Selling and Sales Management	3
TLOG 3613, Business Logistics	3
MKTT 4933, Retail Marketing Strategy	3

**Concentration II: Retail Marketing**

MKTT 4933, Retail Marketing Strategy	3
MKTT 4943, Retail Buying and Merchandise Control	3

**Concentration III: Industrial Marketing**

MKTT 4033, Selling and Sales Management	3
MKTT 4663, Industrial Marketing	3
6 hours MKTL 3000/4000 and/or collateral courses	6

**Junior- senior-level electives within Walton College**

(Only six hours are permitted within a major field) 15

**Total Walton College Requirements** 60

**Total Degree Requirements** 126

SEE PAGE 312 FOR MARKETING AND LOGISTICS (MKTL) COURSES

**Transportation Major**

The major in transportation is designed to prepare students for careers in carrier management and logistics management. Carrier management is the management of the domestic and international modes of transportation. Logistic management applies analytical techniques and uses the systems approach in managing the flow of materials into and through the production and manufacturing processes of a firm to its customers.

Basic employment opportunities exist in marketing, sales, and operations positions with carriers in all transportation modes, and in positions with shippers having responsibility in one or more of the areas under logistics management, warehousing, packaging, and materials handling. Opportunities also exist in governmental agencies.

HOURS

Complete the requirements for a B.S.B.A. degree as listed on page 157.

**Total General Education** 60

**Walton College Core Requirements** (See page 157) 33

**Course Requirements in the Major** 24

TLOG 3443, Prin of Transportation	3
TLOG 3613, Business Logistics	3
TLOG 3623, Purchasing and Inventory Systems	3
TLOG 4633, Transportation Carrier Management	3
TLOG 4643, International Transportation and Logistics	3
TLOG 4653, Transportation and Logistics Strategy	3
6 hours TLOG 3000/4000 and or collateral courses	6

**Junior- senior-level electives within Walton College**

(Only six hours are permitted within major field) 15

**Total Walton College Requirements** 60

**Total Degree Requirements** 126

SEE PAGE 331 FOR TRANSPORTATION AND LOGISTICS (TLOG) COURSES

**WALTON COLLEGE OF BUSINESS (WCOB)**

William P. Curington

Associate Dean for Academic Affairs

328 WCOB

575-7105

These courses are interdisciplinary courses that are not attached to a specific department in Walton College.

SEE PAGE 334 FOR WALTON COLLEGE OF BUSINESS (WCOB) COURSES



# College of Education and Health Professions

## Dean of the College

324 Graduate Education Building  
575-3208

## Associate Dean for Academic Affairs

11 Peabody Hall  
575-4212

## Associate Dean for Administration

306 Graduate Education Building  
575-3082

## Teacher Education/Licensure

8 Peabody Hall  
575-6740

## Honors Program

8 Peabody Hall  
575-4280

## Speech and Hearing Clinic

410 Arkansas Avenue  
575-4509

## Sylvia Hack Boyer Center for Advising

8 Peabody Hall  
575-4203

## Dean

M. Reed Greenwood, Ed.D.  
University of Arkansas

## Associate Dean for Academic Affairs

Betsy Orr, Ed.D.  
University of Arkansas

## Associate Dean for Administration

John W. Murry, Jr., Ed.D.  
University of Arkansas

## World Wide Web:

<http://www.uark.edu/depts/coehp/>

**E-Mail:** [bcss@uark.edu](mailto:bcss@uark.edu)

## MISSION STATEMENT

The mission of the College of Education and Health Professions is to enhance the quality of life of the citizens of Arkansas, the nation, and the world through the development of scholar-practitioners in education, health, and human services.

The goals of the College of Education and Health Professions are as follows:

- Attract and maintain a culturally diverse faculty of high quality and provide a supportive work climate that is conducive to professional growth and development.
- Attract and retain a culturally diverse student population of high quality and prepare students to assume roles as scholar-practitioners.
- Assist in the building and maintenance of library holdings and other information resources supporting academic programs, research, and service.
- Model, promote, and support excellence in teaching.
- Ensure levels of support, staffing, and enrollments appropriate to college, departments, and program missions, priorities, and functions.
- Produce and disseminate high-quality research, scholarly works, and creative products that contribute to the knowledge base and best practices in all fields.
- Offer nationally accredited and recognized undergraduate and graduate programs.
- Provide high-quality services across the state through educational, professional, and technological programs.

## COLLEGE ORGANIZATION, FACILITIES AND SERVICES

For administrative purposes, the programs of the college are organized under five academic units:

1. Curriculum and Instruction
  - Elementary/Childhood Education
  - Middle Level Education
  - Secondary Education
  - Special Education
2. Educational Leadership, Counseling, and Foundations
  - Counselor Education
  - Educational Foundations
  - Educational Administration
  - Educational Technology
  - Higher Education
3. Eleanor Mann School of Nursing
  - Bachelor of Science in Nursing
4. Health Science, Kinesiology, Recreation, and Dance



Health Science  
Kinesiology  
Recreation

5. Rehabilitation, Human Resources and Communication Disorders  
Adult Education  
Communication Disorders  
Rehabilitation Counseling  
Vocational Education

The Graduate Education Building and Peabody Hall serve as the nucleus of the College of Education and Health Professions' activities. An auditorium, several conference and seminar rooms, classrooms, and offices for individual professors, along with several special administrative and service units such as dean, associate dean for administration, distance education center and educational statistics laboratory are housed in the Graduate Education Building.

Peabody Hall houses several classrooms, offices for individual professors, the Sylvia Hack Boyer Center for Student Services, and the associate dean for academic affairs' office. Additional classroom and office facilities used by the College of Education and Health Professions are located in Ozark Hall, West Avenue Annex, Speech and Hearing Clinic, and the Deaf Education Center in Little Rock.

The HPER Building houses the majority of faculty offices and classrooms for health science, kinesiology, recreation and the Office for Studies on Aging. Specialized indoor space for instruction and recreation includes two dance studios, a fitness-weight training center, a jogging track, a climbing wall, and a combative room. The building also features a Human Performance Laboratory for instruction and research. The department of health science, kinesiology, recreation, and dance utilizes the HPER Building Natatorium, Fulbright tennis courts, and Barnhill Arena for instructional purposes. Intramural/Recreational Sports offices are located on the second level of the HPER Building. The intramural/recreational sports program is a university-wide service program housed in the College of Education and Health Professions. Administered through the department of health, kinesiology, recreation and dance, the program provides recreational activities to the entire university community. The program is organized into five program areas: intramural sports, general recreation, sport clubs, disabled student intramural athletics, and the Outdoor Recreation Center.

The Communication Disorders Program is housed in the Speech and Hearing Clinic. The clinic contains faculty offices, a classroom, a graduate seminar room, teaching and research laboratories, and space and facilities for the provision of services to the speech, language, and hearing impaired. University services are provided through the clinic free of charge to university students.

The Eleanor Mann School of Nursing is housed in Ozark Hall. The nursing program facilities include administrative offices, faculty offices, two classrooms, two laboratories, a conference room, and a computer lab. The School has affiliation agreements for clinical practica with area health care agencies.

Established in 1974, the Regional Continuing Education Center in Rehabilitation provides human resources development programming for personnel employed in rehabilitation programs funded by the Rehabilitation Act. These programs include the following: state vocational rehabilitation agencies, independent living centers, community rehabilitation programs, client assistant programs, and projects with industries in the states of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. The Center is located at the Hot Springs Rehabilitation Center, Hot Springs, Arkansas.

Established in 1981, the Research and Training Center for People who are Deaf or Hard of Hearing conducts research and training programs to enhance rehabilitation efforts on behalf of the 24 million U.S. Citizens who are deaf or hard of hearing. These programmatic efforts are directed toward enhancing the career preparation, job entry and placement, career advancement, and workplace communication accom-

modations consistent with the Americans with Disabilities Act. The Center is located in Little Rock and also operates two graduate training programs in rehabilitation counseling at that location.

### Accreditation and Membership

The State Board of Education accredits the teacher education program at the University. Students who complete the approved program of study leading to initial licensure are eligible to receive licenses to teach at the grade level or in the fields for which they have made preparation upon application and presentation of acceptable scores on the PRAXIS I and PRAXIS II exams; however, students must follow licensure guidelines set forth by the Arkansas Department of Education to be licensed to teach.

The teacher education program of the College of Education and Health Professions is also accredited by the National Council for Accreditation of Teacher Education (NCATE), 2010 Massachusetts Ave., NW, Suite 500, Washington, DC 20036; phone (202) 466-7496; Web: <[www.ncate.org](http://www.ncate.org)>. This accreditation covers the initial teacher preparation programs and/or advanced educator preparation programs including pre-kindergarten through elementary school teachers, middle-school teachers, secondary-school teachers, and school service personnel, which includes administrators and school counselors. Because of the accreditation by the National Council for Accreditation of Teacher Education, students who complete the curricula as outlined in this catalog are eligible to be recommended for licensure in states that agree to certify graduates who are recommended by the College of Education and Health Professions as having fulfilled its requirements.

The teacher education program submits data to Educational Testing Service for its Title II Report. According to data from this report, there were 106 teacher education program completers for the University of Arkansas in 2000-2001. Of these, 100 percent passed the PRAXIS II test by the cut-off date.

The University of Arkansas holds membership in and is accredited by the North Central Association of Colleges and Secondary Schools. The College of Education and Health Professions is also a member of the American Association of Colleges for Teacher Education and the University Council for Educational Administration. The graduate program in communication disorders is accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association. The counselor education graduate program is nationally accredited through the Council for the Accreditation of Counseling and Related Educational Programs (CACREP). The Bachelor of Science in Nursing (B.S.N.) degree program is accredited by the Commission on Collegiate Nursing Education (One Dupont Circle NW, Suite 530, Washington, DC 20036; (202) 887-6791 and by the National League for Nursing Accrediting Commission (61 Broadway, 33rd Floor, New York, NY 10006; (212) 363-5555, ext 153) and approved by the Arkansas State Board of Nursing.

The M.S. degree program in Rehabilitation Counseling is accredited by the Council on Rehabilitation Education, Inc. Graduates of the accredited program are eligible to sit for the Certified Rehabilitation Counselor (CRC) examination.

The Bachelor of Science in Education (B.S.E.) degree program in Recreation is accredited by the National Recreation Park Association/American Association for Leisure and Recreation Council in Accreditation.

### CURRICULA OFFERED FOR INITIAL LICENSURE

#### Nursing Licensure

Completing the minimum requirements for a degree of Bachelor of Science in Nursing will satisfy the academic requirements of licensure as a Registered Professional Nurse. Students must complete all of the requirements set forth by the Arkansas State Board of Nursing to be licensed as a registered nurse. See adviser for details.

## Teacher Licensure and Licensure of other School Personnel

The approved program of study for initial teacher licensure at the University of Arkansas, except for Music and Art education, is the Master of Arts in Teaching (M.A.T.) degree program. The M.A.T. degree program is offered in consecutive summer, fall, and spring semesters with initial enrollment in the summer semester. The M.A.T. is a graduate degree program and requires a minimum of 33 semester hours. The M.A.T. degree program has six areas of emphasis: agriculture education, childhood education, middle level education, physical education, secondary education, and vocational education. Consult the Admission Process for Initial Teacher Licensure Stages I-IV on page 171 and the Graduate School catalog for admission and graduation requirements for the M.A.T. degree program.

The 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. Those wishing to add an additional license or endorsement should contact the Coordinator of Teacher Education for the approved program of study.

The Bumpers College of Agriculture, Food and Life Sciences, College of Education and Health Professions, Fulbright College of Arts and Sciences, and the University Teacher Education Board for Initial Certification have developed the preparation programs leading to initial teacher licensure. 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. Licensure packets may be obtained from the Coordinator of Teacher Education, 8 Peabody Hall, telephone (479) 575-6740 or from the Arkansas Department of Education (501) 582-4342. Students must follow the licensure guidelines as set forth by the Arkansas Department of Education. Consult the Coordinator of Teacher Education for licensure changes.

## ACADEMIC REGULATIONS FOR PROFESSIONAL EDUCATION PROGRAMS

### Admission Process for Initial Licensure

**Stage I:** Enroll in an undergraduate degree program leading to a Potential Teacher Licensure Field. Potential fields include the following:

- Agricultural Education – B.S.A.
- Art Education – B.F.A.
- Elementary Education – B.S.E.
- Human Environmental Sciences Education – B.S.H.E.S.
- Kinesiology K - 12 – B.S.E.
- Middle Level Education – B.S.E.
- Music Education – B.M.
- Secondary Education – B.A., B.S.
- Vocational Education – B.S.E.

**Stage II:** Complete an Evaluation for Internship by October 1 of senior year. Art and Music students should complete the evaluation by October 1 prior to a fall internship and by March 1 prior to a spring internship.

This form is available from the College of Education and Health Professions Web site. The form must be completed and returned to the Coordinator of Teacher Education, 8 Peabody Hall.

Students must meet the following criteria to be cleared for internship:

1. Successfully complete 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.
  2. Obtain a "C" or better in the following pre-education core courses: CIED 1002, CIED 1011, CIED 3023 (PHED 3903 for KINS K-12 majors), CIED 3033, ETEC 2001, ETEC 2002L. For Middle Level Education and Elementary Education a minimum of "C" or higher must be earned in ENGL 1013, ENGL 1023, ENGL 2003, COMM 1313, and MATH 1203 unless UA exemption is earned in one or more of the courses.
  3. Obtain a "C" or better in the six hours of program-specific courses (see your adviser for information).
  4. Schedule a visit with your adviser for additional requirements including admission to upper-division courses.
  5. Consult with your adviser regarding PRAXIS II requirements.
  6. 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.
  7. Complete the Evaluation for Internship. Satisfactory completion of this form does not guarantee admission to the Master of Arts in Teaching (M.A.T.) degree program or other teacher education programs.
- All requirements must be met to be cleared for the internship. Please contact the Coordinator of Teacher Education, 8 Peabody Hall, for more information.
- Stage III:** Admission to M.A.T. Degree Program
- The following minimum criteria are necessary to be eligible for consideration for admission: (Consult with your faculty adviser for additional requirements set by your program.)
1. Meet all requirements in Stages I and 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 bachelors degree program. Some programs require a higher GPA. Consult your adviser for the GPA requirements for your program.
  4. Be admitted to Graduate School. (See *UA Graduate School Catalog* for details.)
  5. 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.
  6. Have signature on file with the Coordinator of Teacher Education documenting agreement with the requirements listed in the M.A.T. handbook. This must be done prior to internship.
- 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. Obtain a minimum cumulative GPA of 3.00.
  3. Complete a minimum of 33 graduate semester hours as specified by program area.
  4. Satisfactorily complete internship. The internship will be completed at an approved school/district in Benton or Washington counties that has been approved by the Northwest Arkansas Partnership Steering Committee.
  5. Complete the PRAXIS II Subject Assessment/Specialty Area Tests and Principles of Learning and Teaching by meeting or exceeding the Arkansas Department of Education cut-off scores.
  6. Pass comprehensive exam.
  7. Have adviser complete program of study form.
  8. Apply for degree at the Graduate School, 119 Ozark Hall.

## Licensure

Students who have completed the Stages listed above must obtain a licensure packet from the Coordinator of Teacher Education, Peabody Hall, Room 8, prior to entering internship.

**NOTE:** 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.

**NOTE:** 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 8.

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.

## Education Placement Services

The University, through the College of Education and Health Professions, maintains placement services for the purpose of cooperating with school officials in filling vacancies with appropriately qualified teachers and helping prospective teachers find suitable vacancies. The University does not recommend candidates for teaching positions unless they have been in residence for at least 12 weeks.

The University provides this service to its students for a nominal registration fee. It is extended to students seeking initial placements and also to alumni who seek advancement to better positions. Such alumni should keep their placement files up to date by re-submitting their registration November 1 of each year with the Education Placement Services. Students who are planning to teach should register during the internship year. The telephone for Education Placement Service is (479) 575-2350.

## Journal of American Deafness and Rehabilitation Association: Monographs

The College of Education and Health Professions is host to the Journal of American Deafness and Rehabilitation Association, whose Monographs are edited by RHAB Professor Douglas Watson. The Journal is now in its 35th year of publication and is considered the nation's leading reference for issues involving rehabilitation of persons who are deaf or hard of hearing.

## Journal of Interpretation

The College of Education and Health Professions is host to the Journal of Interpretation, edited by RHAB Professor Douglas Watson. The Journal of Interpretation, published by the Registry of Interpreters for the Deaf, is considered the most widely read sign language interpreting journal in the world.

## UNIVERSITY TEACHER EDUCATION BOARD FOR INITIAL CERTIFICATION

The University Teacher Education Board for Initial Certification is composed of the associate deans; faculty representatives from the College of Education and Health Professions; Fulbright College of Arts and Sciences; the College of Agricultural, Food and Life Sciences; public school teachers and/or administrators, and students. The functions are to (1) govern the teacher education/ licensure program, which culminates in the Master of Arts in Teaching (M.A.T.) degree; (2) establish general

policies and procedures necessary to maintain quality in the M.A.T. degree program; (3) oversee the general coordination of the initial licensure process; and (4) approve new courses and course changes in the M.A.T. program. The Board serves as a liaison group for the faculties involved and stresses the importance of teacher education as one of the primary responsibilities of the University.

## DEGREES OFFERED

The College of Education and Health Professions offers curricula leading to the Bachelor of Science in Education degree (B.S.E.) in the following programs. Several of these degree programs have concentrations and specialties that are described in the section entitled "Departments, Degree Programs, and Courses."

- Elementary Education
- Health Science
- Kinesiology
- Middle Level
- Recreation
- Communication Disorders
- Vocational Education

The College of Education and Health Professions also offers the curriculum leading to the Bachelor of Science in Nursing. The degree programs are described in this college section under the area of "Departments, Degree Programs and Courses."

## ADMISSION TO THE COLLEGE

All entering students (including freshman, international, and transfer students) admitted to the University of Arkansas, Fayetteville, are eligible for admission to the College of Education and Health Professions.

Students transferring from another college within the University must have a GPA of at least 2.00.

## Transfer of Credit

The policies controlling the granting of credit for course work taken at other institutions apply as follows in the College of Education and Health Professions.

1. Neither hours nor grades earned in transfer work are used in the determination of the student's grade-point average.
2. Transfer courses with grades of "D" will not be accepted by the College of Education and Health Professions.
3. Education courses completed at the lower-division (freshman or sophomore) level at another institution will not count as equivalents of upper-division (junior or senior) level courses offered in the UA College of Education and Health Professions.
4. Courses taken at other institutions of higher education where the course content is designed to be remedial are not accepted.
5. The student should be prepared to submit official course descriptions of transfer course work if there is any question as to whether the College will grant degree credit for such work.

## Undeclared Majors

Students enrolled in the College of Education and Health Professions must declare a major.

## Minors

Students in the College of Education and Health Professions may declare any official academic minor available at the University of Arkansas. Students must notify the Boyer Center for Student Services, 8 Peabody Hall, of their intent to pursue a minor. The college, with the assistance of the college offering the minor, will certify that the require-



ments of the minor have been satisfied. The academic minor will be designated on the student's official transcript. Requirements for the minor are listed in the catalog under the department offering the minor.

### COLLEGE SCHOLARSHIPS

In addition to University granted scholarships and financial aid, the College of Education and Health Professions offers a limited number of scholarships. These awards vary in amount and are usually granted on a one-year basis. Applicants are selected on the basis of promise, character, leadership, scholarship, and financial need.

For details regarding scholarships, write to Associate Dean for Academic Affairs, College of Education and Health Professions, 8 Peabody Hall, University of Arkansas, Fayetteville, AR 72701 or visit the College of Education and Health Professions on the Web. Available scholarships and application forms can be downloaded from the site.

### HONORARY AND DEPARTMENTAL ORGANIZATIONS

There are many general-interest societies and organizations on the campus, and nearly every department of the University maintains an honor society through which high scholarship is rewarded. Of special interest to students in the College of Education and Health Professions are the following:

- Kappa Delta Pi is an honor society for those interested in the field of education
- Phi Delta Kappa is an honor fraternity for graduate students
- Association for Childhood Education for elementary majors
- Delta Pi Epsilon for graduate business education majors
- Kinesiology Club for kinesiology majors
- National Student Speech-Language-Hearing Association for communication disorders majors
- National Student Nurse Association and the Sigma Theta Tau International Honor Society of Nursing are of special interest to nursing majors. Contact the Eleanor Mann School of Nursing for details.
- Phi Beta Lambda for business education majors
- Rehabilitation Counseling Association for Students in the rehabilitation counseling program.
- Student Arkansas Education Association for pre-service teachers

General-interest societies cover a wide field of endeavor, including music, drama, politics, and religion. Many students serve on one or more of the University boards or committees.

### THE SYLVIA HACK BOYER CENTER FOR STUDENT SERVICES

Office of the Associate Dean for Academic Affairs  
E-Mail: [bcss@uark.edu](mailto:bcss@uark.edu)

Office for Certification/Placement

#### Academic Advising

To ensure that students get the personal attention they need and deserve throughout their enrollment, the college has established the Sylvia Hack Boyer Center for Student Services. The Boyer Center for Student Services houses the offices of the Associate Dean for Academic Affairs, Coordinator of Teacher Education, Director for Academics and Accreditation, Director of Advising, the Director of Student Affairs and Diversity, the College's advising center, and placement services.

Students who have 45 hours or less are assigned an academic adviser in the Boyer Center who will assist them with course selection and registration, interpreting University policies and procedures, as well as, identifying sources of academic support.

Questions pertaining to undergraduate and graduate programs,

transfer of credit, teacher licensure, admission to the M.A.T., placement services, student services, and administrative procedures can be directed to the Boyer Center, Peabody Hall, Room 8.

### COLLEGE HONOR ROLL

At the close of each semester, the College of Education and Health Professions publishes an honor roll containing the names of not more than 10 percent of the highest-ranking students in each class. Students shall be eligible for the Honor Roll who are carrying a minimum of 12 semester hours.

### COLLEGE HONORS PROGRAMS

The College of Education and Health Professions offers an honors program. Contact the Director of Academics and Accreditation, Peabody Hall, Room 8, for more information.

### GRADUATION REQUIREMENTS

#### Minimum Requirements for the B.S.E. or B.S.N. Degree

The candidates for a baccalaureate degree from the College of Education and Health Professions must meet University requirements, which specify at least 124 semester hours of work with a grade-point average of at least 2.00 on all work attempted in the University. Students exempting any course must still meet the 124-hour graduation requirement and should consult their adviser for specific program requirements. Exemption of courses does not result in credit earned. The students must comply with the prescriptions and restrictions listed below and under General Studies and must complete the requirements in one or more of the approved degree programs.

Students must also meet all other University Requirements for Graduation, including the University Core requirements (page 44). Students are required to have a pre-graduation check at least one semester prior to graduation. Students who complete the pre-graduation check and meet all University and College of Education and Health Professions requirements, may apply for graduation under the guidelines detailed on page 45. All course work, University requirements, and College requirements must be complete by the deadline for the term in which you applied. Students not graduating in spring, but wishing to walk in the spring commencement ceremony, must apply for graduation by the established priority deadline for the spring term and have no more than 12 hours of course work remaining for the baccalaureate degree. For clarification, please contact the Boyer Center, Peabody Hall, Room 8, at 575-4203.

#### General Studies – Undergraduate Programs

The following are general studies requirements that must be met by all students completing an undergraduate program in the College of Education and Health Professions. Some programs may require specific courses as part of the general studies requirements. Students should consult their adviser for program-specific requirements.

#### Requirements of the College of Education and Health Professions

	HOURS
English	6-9
ENGL 1013	
ENGL 1023	
ENGL 2003 (or exempt with test; see page 43)	
Literature	3
(Teacher education majors must choose from American, English or World Literature)	
Social Sciences	12
(See University Core requirements, page 44;	



3 hours must be U.S. history or government; 3 hours must be PSYC 2003)	
Communication	3
(Speech - COMM 1313) Fine Arts, Humanities (See University Core requirements, page 44)	6
Science	8
(Two courses with laboratories. See University Core requirements, page 44). Four hours of biological science and four hours of physical science are required for teacher education majors.	
Mathematics	3
(College algebra or above)	
Health and Wellness	3
HLSC 1002, Wellness Concepts and PEAC 1621, Fitness Concepts or NURS 3212/3221 for nursing majors	
Media/Computer	3
ETEC 2001/2002L for teacher education majors NURS 3013 for nursing majors	
<b>Total hours required for General Studies</b>	<b>47-50</b>

### GRADUATION WITH HONORS

Graduation with Honors will be conferred to College of Education and Health Professions students based upon their University of Arkansas cumulative grade-point average at the time of graduation. To earn this distinction, a student must have completed at least one-half of the course work required for his or her degree at the University of Arkansas, Fayetteville. The Honors designation will be assigned as follows:

1. For Highest Honors, the student must have a minimum cumulative grade point average of 3.95 and rank in the top 10 percent of the graduating class.
2. For High Honors, the student must have a minimum cumulative grade point average of 3.75 and rank in the top 10 percent of the graduating class.
3. For Honors, the student must have a minimum cumulative grade point average of 3.50 and rank in the top 10 percent of the graduating class.

### GRADUATE STUDIES

The UA Graduate School, in cooperation with the College of Education and Health Professions, offers advanced work in education leading to the degrees of Master of Arts in Teaching, Master of Science, Master of Education, Educational Specialist, Doctor of Education, and Doctor of Philosophy.

The degree of Master of Arts in Teaching leads to initial teacher licensure. Areas of emphasis include agricultural education, childhood education, middle-level education, secondary education, physical education, and vocational education.

The degree of Master of Education (M.Ed.) is offered with areas of concentration in adult education, educational administration, elementary education, education technology, higher education, physical education, recreation, secondary education, special education, and vocational education. The Master of Science degrees in counseling, health sciences, kinesiology, rehabilitation, and speech-language pathology are also offered.

The Educational Specialist degree is undifferentiated but has six areas of specialization: adult education; counselor education; curriculum and instruction, educational administration; higher education; and vocational education.

The Doctor of Education degree is undifferentiated but has five areas of specialization: adult education; educational administration; higher education; recreation; and vocational education.

The Doctor of Philosophy degree is available in counselor education, curriculum and instruction, health science, kinesiology, and rehabilitation.

The Graduate School awards the graduate degrees. Students who are interested in registering for graduate courses or in becoming candidates for these degrees should consult the dean of the Graduate School and read the *Graduate School Catalog*.

Students who plan to study for an advanced degree in the subject-matter field should consult with the head of the department concerning course requirements to be eligible to begin graduate study. Specialization requirements for a B.S.E. degree in the College of Education and Health Professions may not be sufficient in every field to gain admission for graduate study without deficiencies.

## Departments, Degree Programs and Courses

### DEPARTMENT OF CURRICULUM AND INSTRUCTION (CIED)

Tom E. C. Smith  
Department Head  
200 Graduate Education Building  
575-4209  
E-Mail: bcss@uark.edu

Shirley Lefever-Davis  
Coordinator of Graduate Programs  
213 Graduate Education Building  
575-4209

The Department of Curriculum and Instruction sponsors initial teacher licensure programs in the areas of childhood education, middle school education and secondary education. The Department also sponsors endorsements in ESL, gifted and talented, reading and special education. With the cooperation of the department of health, kinesiology, recreation, and dance, the department of vocational and adult education, the J. William Fulbright College of Arts and Sciences, and the Dale Bumpers College of Agricultural, Food and Life Sciences, additional secondary school licensure programs are made available.

SEE PAGE 267 FOR CURRICULUM AND INSTRUCTION (CIED) COURSES

### ELEMENTARY EDUCATION

- Professor Sullivan
- Associate Professors Collier, Imbeau, Lefever-Davis, McGee
- Assistant Professors Beller, Collins, Eilers, Kirkpatrick
- Instructors Cronan, Riggs

The University of Arkansas offers the B.S.E. degree in Elementary Education and the M.A.T. degree in Childhood Education. To be recommended for an initial teaching license in Childhood Education (Pre-kindergarten through Grade 4) the student must complete both degree programs. Information about the M.A.T. degree program in Childhood Education can be found in the UA Graduate School Catalog.

### Academic Regulations for Elementary Education Majors and Others Seeking Admission to the Undergraduate Teacher Education Program

#### Stage 1: Boyer Center Advisement

- Enroll in the undergraduate B.S.E. Program in Elementary Education

- Complete 45 hours
- Obtain a grade of “C” or better in CIED 1002 and CIED 1011 (Introduction to Education/Practicum) and in MATH 1203 or higher
- Establish a GPA of 2.50 or better at the University of Arkansas or on transfer hours
- Successfully pass the PRAXIS I

**Stage 2: Program Advisement**

- Register for and complete screening (participating in an oral interview with program faculty and providing a copy of PRAXIS I passing scores) in the **first** semester advised by elementary education program faculty.
- Eligibility to enroll in subsequent program courses is contingent upon successful screening as well as meeting ALL Stage 1 requirements.
- Establish a GPA of 2.7 or better

**Stage 3: Admission to Undergraduate Teacher Education Program**

- Eligibility to enroll in upper-division classes (CIED 3103, CIED 3113, CIED 4128, CIED 4113, and CIED 4101) is based on successfully meeting all Stage 2 requirements and maintenance of 2.70 or better GPA.

**NOTE:** All professional education courses in CIED must have a grade of “C” or better. Passing PRAXIS I scores and a GPA of 2.7 or better are required for enrollment in upper-division (senior year) professional education courses. CIED 3103 and CIED 3113 are only offered during the fall semester. CIED 4128, CIED 4113, and CIED 4101 are only offered during the spring semester. No teaching methods courses may be taken by correspondence.

**Elementary Education Requirements**

	HOURS
General Studies	24-27
ENGL 1013, Composition I	
ENGL 1023, Composition II	
WLIT (3 hrs), World Literature	
ENGL (3 hrs), literature elective	
HLSC 1002, Wellness Concepts	
PEAC 1621, Fitness Concepts	
ARTS 1003, Art Studio	
PSYC 2003, General Psychology	
MATH 1203, College Algebra	
ENGL 2003, Advanced Composition	
(Exemption by examination or credit in ENGL 2013 or grade of at least “B” in ENGL 1013 and “A” in ENGL 1023 at Fayetteville campus.)	

**NOTE:** All professional education courses in CIED must have a grade of “C” or better. Enrollment in upper-division professional education courses may be limited. Contact advisers for specific details. No teaching methods courses may be taken by correspondence.

Elementary Education/Communication	31
COMM 1313, Fundamentals of Communication	
CIED 4101, Practicum	
CIED 4113, Integrated Communication Skills	
CIED 4128, Content Integration (math, science, social studies)	
HESC 2433, Child Development	
HESC 3402/3401L, Child Guidance	
HESC 4453, Parenting and Family Dynamics	
PSYC 3093, Childhood and Adolescence	
CIED 3263, Language Development for the Educator	

Interdisciplinary Studies	43
Mathematics (12 hours)	
Twelve hours in addition to the general studies requirement of MATH 1203. Six of the 12 hours must include MATH 2213 and MATH 2223.	
General Science (16 hours)	
BIOL 1543/1541L	
Geology course with laboratory	
Physical Science course with laboratory	
Four hours of science elective	
Social Science (15 hours)	
Economics,	
ECON 3053, Economics for Elementary Teachers	
Geography - select one of the following courses:	
GEOG 4793, Geog Concepts for Global Studies	
GEOG 1123, Human Geography	
GEOG 2103, Emerging Nations	
GEOG 2203, Developed Nations	
Political Science	
PLSC 2003, American National Government	
Arkansas History	
HIST 3383, Arkansas and the Southwest or other Arkansas history	
History – select one of the following courses:	
HIST 2003, Hist/American People, 1492 to 1877	
HIST 2013, Hist/American People, 1877- Present	

Pre-Education Core	18
CIED 1002, Introduction to Education	
CIED 1011, Intro to Education Practicum	
CIED 3023, Survey of Exceptionalities	
CIED 3033, Classroom Learning Theory	
ETEC 2001, Educational Technology	
ETEC 2002L, Educational Tech Lab	
CIED 3103, Children’s Literature	
CIED 3113, Emergent and Developmental Literacy	
Psychomotor/Aesthetic Component	13
ARHS 1003, Art Lecture	
ARED 3603, Public School Art for Elementary Schools	
MUED 3813, Music for Elementary Education Majors	
MUED 3810L, Music for Elementary Education Majors Lab	
PHED 3373, Methods and Materials in P.E. for Children	

**Total for Elementary Education 128-131**

**NOTE:** The Advanced Composition requirement should be satisfied during the appropriate semester as advised. ENGL 2003 is not listed since it does not count for degree hours but may be passed by test or exemption (or completion of course). Recommended math electives: MATH 2053, MATH 2103, MATH 3773, STAT 2303.

**M.A.T. Degree Program Requirements 33**

Required Courses for the M.A.T. Core	10
CIED 5012, Measurement/Research/Statistical Concepts for Teachers	
CIED 5022, Classroom Management Concepts for Teachers	
CIED 5032, Curric. Design Concepts for Teachers	
CIED 5052, Seminar: Multicultural Issues	
ETEC 5062, Teaching and Learning with Computer Based Technologies	
Additional Program Requirements	23
CIED 5003, Childhood Seminar	
CIED 5073, Case Study in Childhood Education	
CIED 5173, Literacy Assessment	
CIED 5183, Readings in Early Childhood Education	
CIED 5162, Applied Practicum	

CIED 5063, Contemporary and Futuristic Concerns of Childhood Education

CIED 508V Childhood Ed. Cohort Teaching Internship

**NOTE:** Enrollment in the M.A.T. with an emphasis in Childhood Education is limited. A passing score on the PRAXIS II Early Childhood Education test is a requirement to begin the M.A.T. A passing score on the PRAXIS II Principles of Learning and Teaching: Grades K-6 test is a requirement to graduate from the M.A.T. Other specific application procedures and selection criteria are available in the Department of Curriculum and Instruction, Graduate Education Building, Room 201 or from Childhood Education faculty advisers.

SEE PAGE 280 FOR ELEMENTARY EDUCATION (ELED) COURSES

### MIDDLE-LEVEL EDUCATION

- Professors Graening, Totten
- Associate Professors Johnson, Morrow
- Assistant Professor Beller

The Bachelor of Science in Education (B.S.E.) in middle-level education is a teacher preparation degree that prepares educators for meeting the needs of early adolescents. Grounded in an understanding of and appreciation for the physical, intellectual, emotional, and social development of early adolescents (ages 9 to 14, and/or grades four to eight), the B.S.E. degree provides the pre-requisite knowledge, skills and dispositions necessary for entry into the fifth-year, Master of Arts in Teaching (M.A.T.) program for initial licensure in middle-level education. Candidates for the B.S.E. in middle-level education will be eligible to apply for entry to the M.A.T. program through which they will develop further expertise on educating early adolescents and graduate with the requisite skills and degree for teaching grades four to eight.

**The required University and educational courses for the B.S.E. in middle-level education include the following:**

	HOURS
General Studies (College & University core requirements) English composition, literature, social sciences, communication, science, mathematics, health and wellness, and fine arts and humanities.	47-50
Pre-Education Courses	24
12 Hours Pre-education College Core: Introduction to Education and Practicum (CIED 1002/1011), Educational Technology (ETEC 2001/2002L), Survey of Exceptionalities (CIED 3023), Classroom Learning Theory (CIED 3033)	
12 Hours Designated by Program: The Emerging Adolescent (CIED 3053), Introduction to Middle-Level Principles and Methods (CIED 3043), Early Adolescent Literature (CIED 3073), and Literacy Strategies for Middle-Level Learners (CIED 3063)	
Dual Areas of Concentration	52- 55
In accordance with middle-level licensure in Arkansas, preservice teachers must choose a dual area of concentration with requisite number of hours for both the primary and supporting areas of concentration. Primary/supporting areas are English/social studies (54 hours), social studies/English (55 hours), mathematics/science (53 hours), or science/mathematics (52-53 hours). This dual emphasis lends itself to interdisciplinary instruction that is reflective of middle-level philosophy.	

### **Middle-Level Program Requirements:**

	HOURS
The Emerging Adolescent (CIED 3053) (Prerequisites: CIED 1002/1011, PSYC 2003; pre- or corequisite: CIED 3033)	3
Introduction to Middle-Level Principles and Methods (CIED 3043) (Prerequisite: CIED 3053)	3
Early Adolescent Literature (CIED 3073) (Prerequisite: CIED 3043; corequisite: (CIED 3063)	3
Literacy Strategies for Middle-Level Learners (CIED 3063) (Prerequisite: CIED 3043; corequisite: CIED 3073)	3

### **Admission Requirements**

Upon completion of 45 hours, prospective majors must apply for acceptance into the program and will be evaluated based on the following performance criteria:

- Completion of CIED 1002/1011, Introduction to Education/ Practicum with a grade of "C" or better
- Minimum 2.70 GPA (including transfer hours)

### General Studies

	HOURS
English 1013, ENGL 1023, or ENGL 2003 or exempt with test.	9
Literature (American, English or World)	3
Social Studies	12
(See University State Minimum Core Requirements – 3 hours must be U.S. history or government, 3 hours must be PSYC 2003, and 6 hours of elective introductory-level courses from the following: sociology, history, political science, economics, anthropology, geography, or philosophy)	
Communications (COMM 1313)	3
Fine Arts, Humanities (see University State Minimum Core Requirements)	6
Laboratory Science (4 hours of biological and 4 hours of physical science are required for all students entering M.A.T. program)	8
Mathematics (College Algebra or above)	3
Health and Wellness (HLSC 1002, Wellness Concepts and PEAC 1621, Fitness Concepts)	3
Electives (defined by program)	
<b>Total Hours Required for General Studies</b>	<b>47-50</b>

Pre-education Core Requirements	12
CIED 1002/1011, Introduction to Education/Practicum	3
ETEC 2001/2002L, Educational Technology	3
CIED 3023, Survey of Exceptionalities	3
CIED 3033, Classroom Learning Theory	3

Common Core for all teacher education majors	12
CIED 3053, The Emerging Adolescent	3
CIED 3043, Introduction to Middle-Level Principles and Methods	3
CIED 3073, Early Adolescent Literature	3
CIED 3063, Literacy Strategies for Middle-Level Learners	3
Designated by Middle-Level program	12
<b>Total Hours for Pre-education Core</b>	<b>24</b>

**Dual Areas of Concentration: As determined by State licensure requirements.**

- English/Social Studies
- Social Studies/English

Science/Math or Math/Science	
Students must complete a minimum of 21 (24 for science) required hours in primary area and 9-12 restricted elective hours in supporting area.	
Total Hours for Areas of Concentration	52-55
<b>Total Hours for B.S.E. in Middle-Level Education</b>	<b>124-130</b>
	HOURS
<b>English/Social Studies</b>	
English	33
ENGL 1213, Intro to Literature	
ENGL 2133, ENGL 2143, ENGL 2153, ENGL 2163, History of Literature in English I-IV	
ENGL 4003, English Language and Composition for Teachers	
ENGL 3183, Modern English Syntax and Style	
ENGL 4253 or ENGL 4333, African Literature or African-American Literature	
ENGL 3653, Introduction to Shakespeare	
3-hour course above 3000-level selected from Medieval, Renaissance (excluding Shakespeare), Restoration, or 18th Century Literature	
3-hour course above 3000-level selected from 19th Century, 20th Century or American Literature	
Social Studies	21
HIST 3383, Arkansas and the Southwest	
3 hours from Africa, Asia, Latin America, Near East history: HIST 3033, HIST 3043, HIST 3203, HIST 3233, HIST 3473, HIST 3503, HIST 4313, HIST 4323, HIST 4353, HIST 4383	
GEOG 1123, Human Geography	
ANTH 1023, Introduction to Cultural Anthropology	
HIST 4073, Renaissance and Reformation, 1300-1600	
3-hour course selected from history, anthropology, economics, geography, or sociology	
<b>Social Studies/English</b>	
	HOURS
Social Studies	34
Six hours to be taken as University State Minimum Core Requirement	
HIST 2003/2013, History of American People	
HIST 3383, Arkansas and the Southwest	
WCIV 1003/1013, Western Civilization I/II	
6 hours selected from the following:	
HIST 3033, HIST 3043, HIST 3203, HIST 3233, HIST 3473, HIST 3503, HIST 4313, HIST 4323, HIST 4353, HIST 4383	
ECON 2143 or ECON 3053, Basic Economics-Theory and Practice or Economics for Elementary Teachers	
ECON 4033, History of Economic Thought	
GEOG 1123, Human Geography	
ANTH 1023, Introduction to Cultural Anthropology	
English	21
ENGL 1213, Introduction to Literature	
6 hours selected from the following: ENGL 2133, ENGL 2143, ENGL 2153, ENGL 2163, History of Literature in English I-IV	
ENGL 4003, English Language and Composition for Teachers	
ENGL 4253 or ENGL 4333 African Literature or African-American Literature	
3-hour elective: English course above 3000 level	

or WLIT course above 2333  
ENGL 3653, Introduction to Shakespeare

<b>Math/Science</b>		HOURS
Math		33
MATH 2213/2223, Survey of Mathematical Structures I and II		
MATH 2554/2564, Calculus I and II		
MATH 3133, History of Mathematics		
MATH 3773, Foundations of Geometry		
MATH 2103, Discrete Mathematics		
MATH 2053, Finite Mathematics		
CSCE 1023/1021L, Programming I/Lab		
3 hours selected from MATH 3083, Linear Algebra: STAT 2303, Principles of Statistics: STAT 3013, Introduction to Probability and Statistics		
Science		20
GEOL 1113/1111L, General Geology/Lab		
CHEM 1053/1051L, Chemistry in the Modern World/Lab		
ZOOL 1613/1611L, Principle of Zoology/Lab		
BIOL 3323/3321L, General Genetics/Lab		
GEOL 4643/4641L, Historical Geology/Lab		
<b>Science/Math</b>		
Science		33-34
GEOL 1113/1111L, General Geology/Lab		
CHEM 1053/1051L or CHEM 1074/1071L, Chemistry in the Modern World/Lab or Fundamentals of Chemistry/Lab		
BIOL 3323/3321L or BOTY 1613/1611L, General Genetics/Lab or Plant Biology/Lab		
BIOL 3863/3861L, General Ecology/Lab		
4 hours selected from the following:		
ZOOL 1613/1611L, Principles of Zoology/Lab; BOTY 2404/2400L, Survey of Plant Kingdom/Lab; BIOL 2533/2531L, Cell Biology/Lab		
GEOL 4643/4641, Historical Geology/Lab		
GEOG 3333, Oceanography		
ASTR 2003/2001L, Survey of the Universe		
3 hours selected from the following or other approved science course: BIOL 3023, CHEM 3453/ 3451L, CHEM 4043, GEOL 2313/2310L, GEOL 3313/ 3310L, PHYS 3603		
Math		19
MATH 2213/2223, Survey of Mathematical Structures I and II		
MATH 2554, Calculus I		
MATH 3133, History of Mathematics		
MATH 3773, Foundations of Geometry		
STAT 2303 or STAT 3013, Principles of Statistics or Introduction to Probability and Statistics		
<b>NOTE:</b> The program above describes the minimum requirements for a degree in Middle-Level Education. Interested students should consult a Middle-Level Program faculty adviser regarding licensure requirements.		
<b>Admission requirements for the Middle Level M.A.T. degree program for initial licensure are as follows:</b>		
The Master of Arts in Teacher (M.A.T.) degree program in Middle Level Education is a 34-semester hour program. The M.A.T. degree is the initial licensure program for students at the University of Arkansas,		



**Prerequisites to the M.A.T. Degree Program:** Students will be selected up to the maximum number designated for each cohort area of emphasis.

Admission Requirements:

1. Completion of the pre-education core on page 176 with a minimum of "C" in all courses
2. Completion of all prerequisite courses in teaching field
3. Passing Scores on PRAXIS I
4. Satisfactory completion of Evaluation for Internship
5. Completion of a B.S.E. in Middle Level Education (Social Studies/English, English/Social Studies, Math/Science, or Science/Math)
6. Cumulative GPA of 3.00 in all previous courses
7. Admission to the Graduate School
8. Admission to the Teacher Education Program
9. Recommendation from the Department of Curriculum and Instruction based upon:
  - a. Middle level writing assessment
  - b. Interview with middle level education faculty and public school administrators and faculty
  - c. Portfolio

SEE PAGES 267 FOR MIDDLE LEVEL EDUCATION (CIED) COURSES

### **SECONDARY EDUCATION (SEED)**

- Professors Besonen, Farah, Graening, Taylor, Totten
- Associate Professors Morrow, Wavering
- Assistant Professor Lincoln

### **Secondary Schools Program**

Students certifying to teach in grades 7-12 will receive a degree from the J. William Fulbright College of Arts and Sciences with a specialization in one of the following areas: anthropology, biology, chemistry, communication, drama, economics, English, foreign language, geography, geology, history, journalism, mathematics, physics, political science, psychology, sociology, or any other appropriate degree.

The following 18-hour, Pre-Education Core will be included in the undergraduate degree program:

- CIED 1002, Introduction to Education
- CIED 1011, Introduction to Education Practicum
- ETEC 2001, Educational Technology
- ETEC 2002L, Educational Tech Lab
- CIED 3023, Survey of Exceptionalities
- CIED 3033, Classroom Learning Theory
- CIED 4201, Seminar: Introduction to Professionalism
- CIED 4210, Practicum: Critical and Creative Thinking Skills
- CIED 4211, Seminar: Critical and Creative Thinking Skills
- CIED 4221, Seminar: Structure of the Disciplines
- CNED 4003, Classroom Human Relations Skills

Students with an appropriate baccalaureate degree and upon completion of the Pre-Education Core may apply to the Master of Arts in Teaching program to complete a master's and licensure. See the Graduate School Catalog for information about the M.A.T. program.

### **Secondary Education M.A.T. Application Process**

#### **I. Preliminary Admissions**

Students complete a preliminary admissions form at the end of CIED 1002/1011 indicating teaching field intent, anticipated date to enter M.A.T., GPA (including transfer work) and completion of PRAXIS I. Students who transfer CIED 1002/1011 from another institution must complete the form at the time of first enrollment.

### **II. Candidacy Status**

1. Complete Evaluation for Internship by October 1.
2. File Graduate School Application by November 1.
3. Complete admission screening interview (to be scheduled early in the Spring semester).
4. At the time of the interview, candidates must have a GPA of 2.70, have passed the PRAXIS I, submitted three letters of reference, and submitted a portfolio. Foreign language majors must submit proof of having passed the foreign language proficiency exam.
5. The list of students will be reduced to 50 at this time.
6. The probationary status will include the content specific courses of the spring semester, plus the first 6 hours of the MAT taught during the summer 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.
7. At the completion of the 6 hours of MAT courses, the secondary faculty will convene to review the status of the 50 candidates.

### **III. Professional Standing Status**

Professional Standing Status will be granted at completion of the first 6 hours of M.A.T. courses and after faculty review. (For details, contact the Department of Curriculum and Instruction, Graduate Education Building 201.)

SEE PAGE 330 FOR SECONDARY EDUCATION (SEED) COURSES

### **SPECIAL EDUCATION (SPED)**

- Professor Gartin, Smith
- Associate Professor Imbeau
- Assistant Professor Collins
- Instructor Jordan

State licensure requirements for special education have changed effective January 1, 2002. The University of Arkansas no longer offers an undergraduate degree in special education. Information regarding the Master of Education in special education can be found in the University of Arkansas Graduate School Catalog.

SEE PAGE 331 FOR SPECIAL EDUCATION (SPED) COURSES

### **DEPARTMENT OF EDUCATIONAL LEADERSHIP, COUNSELING, AND FOUNDATIONS (ELCF)**

Position Open  
 Department Head  
 234 Graduate Education Building  
 575-4207  
 E-Mail: bcss@uark.edu

James Swartz  
 Coordinator of Graduate Studies  
 251 Graduate Education Building  
 575-2207

The department of educational leadership, counseling, and foundations offers graduate-level courses in five distinctive academic and degree programs. Master's, specialist, and doctoral degrees may be obtained in counselor education, educational administration, and higher education. A master's degree may be obtained in educational technology.

gy. Educational foundations offers courses in research and statistics for all programs. Undergraduate courses are offered by counselor education and educational technology.

### **COUNSELOR EDUCATION (CNED)**

- Professors Farley, Greenwood
- Associate Professor Roland
- Assistant Professor Newgent
- Instructor Rogers-Stephen

SEE PAGE 270 FOR COUNSELOR EDUCATION (CNED) COURSES

### **EDUCATIONAL ADMINISTRATION (EDAD)**

- Associate Professors Elliott, Hughes
- Assistant Professors Holt, Noggle

SEE PAGE 279 FOR EDUCATIONAL ADMINISTRATION (EDAD) COURSES

### **EDUCATIONAL TECHNOLOGY (ETEC)**

- Associate Professors Murphy, Swartz
- Assistant Professor Brescia
- Instructor Cohen

SEE PAGE 286 FOR EDUCATIONAL TECHNOLOGY (ETEC) COURSES

### **HIGHER EDUCATION (HIED)**

- Professors Gearhart, Hammons, Lucas
- Associate Professors Gohn, Murry
- Adjunct Associate Professors Brazzell, Conneely, Williams
- Adjunct Assistant Professors Carry, Gordon, Stauffacher

SEE PAGE 295 FOR HIGHER EDUCATION (HIED) COURSES

### **EDUCATIONAL FOUNDATIONS (EDFD)**

- Professors Lucas, Mulvenon, Stegman
- Associate Professors Denny, Swartz, Turner
- Assistant Professor Ritter,
- Visiting Assistant Professor Connors

SEE PAGE 280 FOR EDUCATIONAL FOUNDATIONS (EDFD) COURSES

### **DEPARTMENT OF HEALTH SCIENCE, KINESIOLOGY, RECREATION, AND DANCE**

Sharon Hunt  
Department Head  
306 HPER Building  
575-2857  
E-Mail: bcass@uark.edu

Susan Mayes  
Coordinator of Undergraduate Studies  
308 HPER Building  
575-2859

The department offers programs leading to the B.S.E. degree with major emphasis in either health sciences, kinesiology, or recreation.

### **DANCE ACTIVITY (DEAC)**

- Instructor Mayes

SEE PAGE 277 FOR DANCE ACTIVITY (DEAC) COURSES

### **HEALTH SCIENCES (HLSC)**

- University Professor Young
- Associate Professors Jones (C.), Turner
- Visiting Assistant Professors Mink, Williams

The program in health science is designed to prepare candidates for a variety of career options in the vast field of health education and health promotion. Career opportunities may include planning, developing and delivery of health programs in various settings. These settings may include hospitals, government agencies, non-profit organizations, community organizations, corporations, and other places of occupation. Graduates of this program should be well prepared to enter the work force at an entry level position in community health or graduate programs of study in such areas as health education and health promotion, corporate health, public health, health care administration, and other allied health professional schools.

The candidate for the Bachelor of Science in Education degree with a major in health science will focus on community health. All students must complete the University Core requirements as listed on page 44 and the College of Education and Health Professions requirements as listed on page 173. In addition, all students must take the courses listed below under required general studies for the health science major and the additional health science major requirements. A minimum of 127 semester hours is required for graduation in the major of health science.

**NOTE:** A student preparing to teach in the public schools in kinesiology and health science must major in kinesiology with a K-12 concentration, complete pre-M.A.T. requirements, graduate with a cumulative GPA of 2.70 or above and earn a Master of Arts in Teaching degree (M.A.T.) to be eligible to apply for initial teacher licensure in the State of Arkansas. Students planning on applying for the M.A.T. and other post-baccalaureate programs should consult the *Graduate School Catalog* for information on prerequisites and requirements.

### **Curriculum for a Major in Health Science**

	HOURS
Required general studies for the Health Science Major	13-14
BIOL 1543/1541L, Principles of Biology	
CHEM 1103/1101L/1100D, University Chemistry I	
SOCI 2013, General Sociology	
<b>NOTE:</b> HLSC 1103 is recommended in lieu of HLSC 1002.	
Health Science Major Requirements	80
HESC 1213, Nutrition in Health	
HLSC 1203, Prevention of Drug Abuse	
HLSC 1303, Introduction to Human Sexuality	
HLSC 2613, Foundations in Health Education	
HLSC 2653, Introduction to Community Health	
HLSC 2662, Terminology/Health Professions	
HLSC 3003, Practicum in Community Health	
HLSC 3623, Human Diseases	
HLSC 3633, First Responder - First Aid	
HLSC 3643, Community Health Plan/Promotion	
HLSC 3663, Principles of Mental Health	
HLSC 3683, Health Care Consumerism	
HLSC 404V, Community Health Preceptorship (6 hrs)	
JOUR 1023, Media and Society	
MBIO 2013/2011L, General Microbiology	
PSYC 3093, Childhood and Adolescence	

3 hours of PSYC elective  
 ZOOL 1613/1611L, Principles of Zoology and Lab  
 or BOTY 1613/1611L, Plant Biology and Lab  
 ZOOL 2213/2211L, Human Physiology  
 ZOOL 2443/2441L, Human Anatomy  
 SCWK 3163, On Death and Dying  
 PSYC 4023, Adulthood and Aging  
 or SCWK 3183, The Elderly Citizen  
 PSYC 4133, Behavior Modification  
 5 hours of health science electives (adviser approved)

SEE PAGE 297 FOR HEALTH SCIENCES (HLSC) COURSES

### **KINESIOLOGY (KINS)**

- University Professor Brown
- Professors Di Brezzo, Fort, Gorman, Riggs
- Associate Professor Lirgg
- Clinical Associate Professor Kern
- Assistant Professors Ferguson, Graening
- Clinical Assistant Professors Bonacci, Smith-Nix
- Instructors Forbess, Mayes, Vardiman
- Lecturer Mears

The program in kinesiology is designed to prepare candidates for a variety of career options in the vast field of movement science. Career opportunities may include teaching physical education, coaching, analyzing and prescribing fitness programs, athletic training or preparation for professional programs in allied health. Graduates of this program should be well prepared to enter graduate programs of study in such areas as pedagogy or adapted physical education, exercise physiology, biomechanics, athletic training, sport management, medical school, physical therapy school and other allied health professional schools.

The candidate for the Bachelor of Science in Education degree with a major in kinesiology must select one of five concentrations:

1. K-12 Teaching Physical Education/Health
2. Exercise Science – Exercise Physiology/Biomechanics
3. Exercise Science – Pre-Professional
4. Exercise Science – Fitness Specialist
5. Exercise Science – Pre-Athletic Training

All students must complete the University Core requirements as listed on page 44 and the College of Education and Health Professions requirements as listed on page 173. In addition, all students must take the required general studies for the kinesiology major and the kinesiology core requirements listed below. As part of the University Core requirements and College of Education and Health Professions requirements, specific math and science courses are required within the kinesiology major and concentrations. A student preparing to teach in the public schools must select the K-12 teaching concentration, complete the stages of admission for initial licensure as listed on page 171, have a cumulative GPA of 2.70 or above, and be admitted to Graduate School to be eligible to apply for initial teacher licensure. Students interested in obtaining an endorsement in coaching should contact the Coordinator of Teacher Education, Peabody Hall room 8. Students planning on applying for other post-baccalaureate programs should inquire as to prerequisite requirements. Students planning on a major in kinesiology with a concentration in exercise science (concentrations II, III, IV, or V) must earn a grade of “C” or better in KINS 3153, KINS 3353 and KINS 3533. A minimum of 124 semester hours is required for graduation in the major of kinesiology. The total hours may vary slightly depending on the concentration of study.

### **Curriculum for a Major in Kinesiology**

Required general studies for the Kinesiology Major	8
CHEM 1103/1101L/1100D, University Chemistry I or, for K-12 Concentration only, any 4-hour State Minimum Core chemistry with lab	
ZOOL 2443/2441L, Human Anatomy	

Kinesiology Core	12
KINS 1013, Careers in Kinesiology: A History and An Overview	
KINS 2223, Motor Development	
KINS 3153, Exercise Physiology (for Exercise Science Concentrations II-IV) or KINS 3163 Exercise Physiology: Theory and Application (for K-12 Concentration I)	
KINS 3353, Mechanics of Human Movement	

Students with a major in kinesiology must select one of five concentrations:

- I. K-12 Teaching Physical Education/Health
- II. Exercise Science - Exercise Physiology/Biomechanics
- III. Exercise Science - Pre-Professional
- IV. Exercise Science - Fitness Specialist
- V. Exercise Science - Pre-Athletic Training

#### **Concentration I: K-12 Teaching**

Physical Education/Health	57-60
RECR 1001L, Outdoor Recreation Lab	
BIOL 1543/1541L, Principles of Biology	
PHED 2003, Teaching Styles/Lesson Planning	
PHED 2013, Teach Progressions/Assessment of Basic Skills	
PHED 2023, Teach Progressions/Assessment of Advanced Skills	
PHED 3012, Teaching Games	
PHED 3022, Teaching Stunts/Tumbling	
PHED 3032, Teaching Rhythms	
PHED 3042, Teaching Fitness	
(replaces COEHP requirement for PEAC 1621)	
PHED 3203, Principles and Problems of Coaching	
PHED 3903, P.E./Special Populations	
(replaces COEHP Pre-MAT requirement for CIED 3023)	
KINS 3373, Phil/Soci Impact on Kinesiology	
PHED 4053, Teaching Individ/Dual Sports	
PHED 4063, Teaching Team Sports	
KINS 4413, Org/Man/Mktt Skills for Kinesiology	
HLSC 3633, First Responder - First Aid	

#### **Pre-Education Core Specialty Program Courses**

KINS 2223, Motor Development (hours counted in the kinesiology core)	
CNED 4003, Classroom Human Relations Skills	
11-14 hours toward course content in Health Science (see adviser for available course choices) or other adviser-approved electives	

The fifth-year program in the K-12 Concentration consists of 33 hours of graduate courses including student teaching internship and a comprehensive exam. Successful completion should result in eligibility for teaching licensure and the Master of Arts in Teaching (M.A.T.) degree. (Refer to the *Graduate School Catalog* for special requirements.)

#### **Exercise Science Core**

Requirements for Kinesiology (Exercise Science) Concentrations II, III, IV, and V.	40
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CHEM 1123/1121L/1120D, University Chemistry II	
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(not required for Concentration V)  
 PHYS 2013/2011L/2010D, College Physics I  
 PHYS 2033/2031L/2030D, College Physics II  
 (not required for Concentrations IV, V)  
 ZOOL 2213/2211L, Human Physiology  
 HESC 1213, Nutrition in Health  
 PSYC 4183, Physiological Psychology  
 (not required for Concentrations IV, V)  
 CNED 3053, The Helping Relationship  
 KINS 3533, Laboratory Techniques  
 KINS 405V, Independent Study (3 hrs)  
 or KINS 4903, Internship  
 KINS 4323, Analytical Basis/Movement  
 KINS 4733, Senior Seminar  
 KINS 4833, Exercise Appl/Spec Pops

#### **Concentration II: Exercise Science - Exercise Physiology/ Biomechanics**

BIOL 1543/1541L Principles of Biology/Lab  
 PSYC 2013, Intro to Statistics for Psych.  
 or adviser-approved statistics course  
 MATH 2043, Survey of Calculus  
 CHEM 2613/2611L/2610D, Organic Physiol. Chem  
 CHEM 3813, Intro to Biochemistry  
 Additional adviser-approved electives (11 hrs.)

#### **Concentration III: Exercise Science – Pre-Professional**

PSYC 2013, Intro to Statistics for Psych.  
 or adviser-approved statistics course  
 MATH 2043 Survey of Calculus (depending  
 on post-baccalaureate plans, see adviser)  
 CHEM 3603/3601L/3600D, Organic Chemistry I  
 CHEM 3613/3611L/3610D, Organic Chemistry II  
 CHEM 3813, Intro to Biochemistry  
 Additional adviser-approved electives (10-11 hrs.)

#### **Concentration IV: Exercise Science – Fitness Specialist**

MATH 1203, College Algebra  
 MATH 1213, Plane Trigonometry  
 CHEM 2613/2611L/2610D, Organic Physiol. Chem  
 PSYC 3023, Abnormal Psychology  
 (takes place of PSYC 4183 in Exercise Science Core)  
 MGMT 3563, Management Concepts in Org. Behavior  
 MKTT 3433, Principles of Marketing  
 (Prerequisite: ECON 2013 and ECON 2023  
 or ECON 2143 or AGECE 1103 and AGECE 2103)  
 KINS 4773, Performance and Drugs  
 VOED 4403 Nutrition Education and Counseling  
 Additional adviser-approved electives (10 hrs.)

#### **Concentration V: Exercise Science – Pre-Athletic Training**

BIOL 1543/1541L, Principles of Biology  
 ETEC 2001/2002L Educational Technology/Lab  
 MATH 1203, College Algebra  
 MATH 1213, Plane Trigonometry  
 PSYC 3023 Abnormal Psychology  
 (takes place of PSYC 4183 in Exercise Science Core)  
 KINS 2393, Prevention and Care/Athletic Injuries  
 KINS 3413, Evaluative Techniques for Athletic Training  
 KINS 3663, Rehabilitation of Athletic Injury  
 KINS 4773, Performance and Drugs Professions  
 HLSC 2662, Terminology for the Health Professions  
 HLSC 3633, First Responder - First Aid  
 VOED 4403 Nutrition Education and Counseling  
 Additional adviser-approved electives (6 hrs.)

SEE PAGE 304 FOR KINESIOLOGY (KINS) COURSES

### **PHYSICAL EDUCATION ACTIVITIES (PEAC) BASIC INSTRUCTION IN PHYSICAL EDUCATION (PEAC)**

SEE PAGE 318 FOR PHYSICAL EDUCATION ACTIVITIES (PEAC)  
COURSES

### **RECREATION (RECR)**

- Professor Hunt
- Associate Professors Langsner, Moiseichik
- Assistant Professor Hughes
- Instructor Mock

The program of recreation is designed to prepare candidates for a variety of career opportunities in the field of recreation and parks. Career opportunities may include park and recreation directors for a city, therapeutic recreation specialists, fitness center managers, state and national park managers, camp administrators, or work in YMCAs, Boys and Girls Clubs or other youth serving agencies. Graduates of this program should be well prepared to enter the recreational workforce at an entry level position or pursue graduate studies in such areas as recreation management, sport management, or other allied health professional schools.

The candidate for the Bachelor of Science in Education degree with a major in recreation must select a concentration of study in an area of interest with help from an academic adviser from the recreation faculty. Each concentration is developed individually to meet specific career goals. Concentrations are 18-21 hours, generally in academic areas other than the recreation program. Examples of concentrations of study include, but are not limited to, public recreation, children and families, fitness club management, commercial recreation, aquatic management, therapeutic recreation, camp administration, outdoor leadership, community sports, youth at risk, and outdoor recreation.

All students must complete the University Core requirements as listed on page 44 and the College of Education and Health Professions requirements as listed on page 173. In addition, all students must take the required general studies for the recreation core requirements listed below. As part of the University Core requirements and College of Education and Health Profession requirements specific social sciences and science courses are required within the recreation major and concentration requirements. Recreation majors must obtain a "C" grade or better in all courses beginning with the alpha code RECR. To enroll in RECR 440V, students must have a 2.50 GPA or better in RECR core and concentration courses. Many courses in the recreation curriculum are taught in sequential order. Please check catalog course descriptions for prerequisites.

There are several experiential requirements within the recreation core. Students are required to do three practicum experiences (RECR 201V) in three different agencies. Each experience totals 45 hours. A more intense experience of an internship (RECR 440V) requires a minimum of 400 hours or work full time for 12-15 weeks in an agency with a qualified park and recreation professional. Students in the recreation program must get certification at the instructor-level or higher in at least two areas of expertise. Certifications must be valid at the time of graduation and be completed before a grade will be assigned in RECR 4013, Contemporary Issues in Leisure. Examples of these certifications include, but are not limited to, water safety instructor, aerobics instructor, American Red Cross canoeing instructor, first-aid instructor, and hunter safety instructor. A minimum of 124 hours are required for graduation in the major of recreation. The total hours may vary slightly depending on the study concentration.

An undergraduate minor in recreation is also available to students



enrolled in other colleges. Students with interests related to the recreation profession such as business, biology, human environmental science or horticulture may elect the 15-hour minor. This minor could enhance future career opportunities.

### Curriculum for a Major in Recreation

	HOURS
Required General Studies for the Recreation Major PLSC 2003, American National Government SOC1 2013, General Sociology	6
Recreation Core	51
RECR 1003, Professional Foundations of Leisure RECR 1023, Recreation and Natural Resources RECR 201V, Recreation Practicum (three one-credit experiences) RECR 2063, Commercial Recreation and Tourism Enterprise RECR 2813, Leadership Techniques in Recreation RECR 3833, Program Planning in Recreation RECR 3843, Planning, Design and Maintenance for Recreation RECR 3853, Leisure Behavior RECR 3873, Sport and Recreation Risk Management RECR 4003, Innovative Practices in Recreation RECR 4013, Contemporary Issues in Leisure RECR 4083, Research and Evaluation in Recreation RECR 4093, Fundamentals of Therapeutic Recreation RECR 440V, Internship (9 hours) HLSC 3633, First Responder-First Aid	
Directed Study Concentration Selected with help from an academic adviser from the recreation faculty.	18-21

### Curriculum for a Minor in Recreation

	HOURS
Minor Requirement	15
RECR 1003, Professional Foundations of Leisure RECR 2813, Leadership Techniques in Recreation RECR 3833, Program Planning in Recreation RECR 3873, Sport and Recreation Risk Management RECR elective course selected to compliment major (see adviser)	

SEE PAGE 327 FOR RECREATION (RECR) COURSES

## ELEANOR MANN SCHOOL OF NURSING (NURS)

Marianne Neighbors  
Interim Director  
217 Ozark Hall  
575-3904  
E-Mail: [bcss@uark.edu](mailto:bcss@uark.edu)

- Professor Neighbors
- Associate Professors Barta, Lawson
- Assistant Professor Smith-Blair
- Instructors Breckenridge, Buron, Kolb-Selby, McConaughy, Meadows

The mission of the Eleanor Mann School of Nursing is to promote the health of society through education of professional nurses, research and service. The School, as an established entity within the College of Education and Health Professions and the University of Arkansas, Fayetteville, subscribes to the philosophy and stated mission of the University of Arkansas on teaching, research, and service. The School

of Nursing provides nursing education to meet expanding health care needs. In recognition of the interrelationship between teaching, research, service, and the practice of nursing, in the changing health care needs of society, the faculty aspires toward excellence in teaching, contributes to research in nursing, and promotes improved health care.

The philosophy and purposes of the education are a synthesis of the personal beliefs of the faculty in relation to the person, society, environment, health, nursing, education, the learning process, and the role of the graduates of the program.

The person is a unique five dimensional being of interrelated and inseparable systems (biological, intellectual, psychological, social and spiritual) from which needs arise as the person develops throughout the life span. Each person is a member of a larger cultural, racial, and/or ethnic group and is unique in the way in which the dimensions are developed, intersected and expressed. Environment influences the person's health within each of these dimensions. The person is influenced by and interacts as a whole with the internal and external environment to preserve vital functions, dignity and a meaningful existence.

Society is a dynamic and multicultural phenomenon functioning within the ever-changing environment. The basic unit in society is the family. It functions to socialize its members to cultural values and norms and is highly influential in shaping the health behaviors of its members. Individual persons and family groups combine and intersect to form and function as larger distinct and indistinct community units. These units also have needs that arise from biological, intellectual, psychological, social and spiritual dimensions. The health of the person, family or community impinges on and affects the health of the others. Society has given nursing and other health care professionals the latitude and responsibility to assist clients (individuals, families, and communities) in meeting health care needs.

The environment, internal and external, consists of those forces that influence the dimensions of the client. These complex factors act upon the client and ultimately determine its form, survival and evolution. When the forces affect health, nursing becomes an integral part of the environment to assist the client in maximizing health.

Health is a general condition involving the total client within the environment. Health is dynamic and relative, wherein the person exists at varying points along the wellness-illness continuum. Wellness and illness are relative states of health and may be a matter of one's perception.

Nursing is a helping relationship that assists the client in achieving wellness. It is both an art and a science. Professional nursing is derived from a specialized body of knowledge. The professional nurse draws from various academic disciplines to diagnose and make treatment decisions. Critical thinking is essential to the diagnoses and treatment decisions in nursing. The professional nurse practices in a variety of settings and collaborates with other health care professionals to assist the client in promoting health, preventing illness, maintaining or restoring wellness, or to cope with death. The therapeutic and significant contribution of nursing is through performance in the roles of caregiver, manager and teacher using research-based practice in health care. A critical thinking approach known as the nursing process is used to meet health care needs.

Professional nursing begins with a Bachelor of Science degree. Nursing education offers a research base for nursing practice that promotes the ability of the nurse to effect change needed to improve health. It is a process by which knowledge is continually synthesized and directed toward meeting the health care needs of clients. The learner develops and applies intellectual, interpersonal and psychomotor skills in assisting clients in a variety of settings. Professional nursing education develops critical thinking, and acceptance of responsibility for nursing interventions and accountability for outcomes. In the study of professional nursing the student builds on a planned general education from the academic disciplines and acquires theoretical and specific knowledge to meet health care needs. In addition the curriculum pro-

vides opportunity for students with technical nursing education to expand their knowledge and scope of practice. The baccalaureate program establishes a foundation for graduate education in nursing and for continued personal and professional development.

Learning takes place within the student and is ultimately the responsibility of the student. Knowledge and skills are enhanced when the student derives satisfaction from the learning environment and has the opportunity to explore and express thoughts and feelings. Acquisition of knowledge and skills promotes development of the student and is manifested by a change in behavior.

Faculty have the responsibility to ensure the quality of the nursing program. They define levels of expectations for students and maintain standards of nursing practice. They focus on students' learning needs when they select or manipulate the environment to enhance experiential learning. Faculty guide and direct learning through the development and implementation of the curriculum and through planned periodic evaluations based on program criteria. In clinical agencies, faculty and practicing nurses are role models for students.

Within a climate of mutual respect, students and faculty share in an interdependent enterprise of learning, inquiry and teaching. With guidance, students develop the ability to use critical thinking to integrate eclectic knowledge with current nursing theory and research-based practice. They learn personal and professional responsibility and accountability. Progress, or lack of, in meeting performance expectations and improvements necessary for success is identified by teacher evaluation and student self-evaluation.

The baccalaureate graduate, as a member of the discipline, uses knowledge from a research base to fulfill the roles of the nurse in contemporary society as a caregiver, manager, and teacher. On entry into practice the graduate performs the following:

1. Uses critical thinking in making clinical judgments to deliver holistic nursing care,
2. Uses theory and research-based knowledge to improve delivery of nursing care to meet health care needs of individuals, families, and communities,
3. Develops, implements, and evaluates health-related education based on assessed needs,
4. Applies information and health care technologies to assess, monitor, and support clients, families, and communities,
5. Designs, manages and coordinates health care for individuals, families and communities,
6. Uses ethical principles in nursing practice, conduct, and relationships with clients, and
7. Identifies with the values of the profession and incorporates them into practice.

The baccalaureate nurse works singularly or in collaboration with other health care professionals in coordinating and promoting culturally sensitive health care.

The Eleanor Mann School of Nursing at the University of Arkansas prepares students to enter the professional practice of nursing and/or pursue graduate-level nursing education. The curriculum provides the student with a theoretical base to practice professional nursing with diverse clients in various settings through the roles of caregiver, manager and teacher. The program of study has been designed to emphasize one or more of these roles in each nursing course. Graduates of the program are eligible to apply to take the NCLEX examination for licensure as a registered nurse (R.N.). Persons convicted of a crime may not be eligible to take the NCLEX examination. A criminal background check is required before graduation and reported to the Arkansas State Board of Nursing as part of the procedures for application for licensure.

The Bachelor of Science in Nursing degree (B.S.N.) is awarded after successful completion of the nursing curriculum.

The Eleanor Mann School of Nursing offers a limited number of scholarships specifically for nursing students admitted to the School.

These scholarships are awarded by the scholarship committee of the School of Nursing and include the Beverly, Jerry Wade Davis Jr., the Mervin Harold Davis Jr., Mina Marshall, Richter, and Stars for Nursing Scholarships. Contact the Eleanor Mann School of Nursing about the guidelines and application deadlines.

## ADMISSION TO THE B.S.N. PROGRAM

### Admission Policies

Admission to the B.S.N. program is limited. Final approval for admission will be determined by the Eleanor Mann School of Nursing faculty. Requirements for admission into the professional program of study are as follows:

1. Overall minimum grade-point average (GPA) of 2.75. (Transfer GPA will be factored in if it is to the student's benefit. If the UA GPA is based on at least 12 hrs of study and is greater than the transfer GPA, the UA GPA will be used. If the student has less than 12 hrs at the University of Arkansas, the transfer GPA will be factored in.)
2. Students will be ranked according to GPA for admission to the program.
3. Applications for admission must be submitted by December 1 for admission consideration. Late applications will be considered on a space-available basis.
4. Selection process will be completed by March 1.
5. All general education courses must be completed at the end of the spring semester prior to beginning the professional program of study.
6. Professional program of study begins in the summer following the sophomore year.
7. Students transferring from another nursing program must be eligible to return to that program to be considered for admission.
8. Students must meet the performance standards for the professional program of study.
9. CPR certification (American Heart Association program) is required.
10. The completed Hepatitis B vaccine series must be verified.
11. Negative Tuberculin skin test or x-ray is required.
12. Health and liability insurance is required (check with the School of Nursing).
13. A car or reliable transportation is required.
14. A criminal background check with fingerprinting is required and reported to the Arkansas State Board of Nursing.
15. Some clinical agencies require students to complete a negative drug screening and criminal background check before students can be placed in the agency. To complete appropriate clinical experiences, students will have to comply with these requirements.

### Advanced Placement for Registered Nurses

Applicants to the R.N. to B.S.N. track must meet the following requirements:

1. College of Education and Health Professions admission requirements
2. Eleanor Mann School of Nursing Admission Requirements
3. Completed the general education studies. (RN students who have completed 45 hrs. of the required general studies may petition for exception to this policy if MATH 1203, PSYC 2013, and NURS 3013 have been completed.)
4. Graduated from an Arkansas State Board of Nursing approved program or an accredited out-of-state program
5. Have nursing courses reviewed for transfer credit by the School of Nursing

6. Provide proof of and maintain unencumbered licensure to practice as a Registered Nurse in Arkansas
7. Requirements necessary to receive advanced placement may vary with length of time since graduation and length of time of (or since) nursing employment.
8. Credit for courses listed below will be held in escrow. The student will receive credit for these courses upon successful completion of the program.

NURS 3032	NURS 3042L
NURS 3212/3221	NURS 3312
NURS 3422/3423	NURS 3634/3643
NURS 3742/3752	NURS 3841L
NURS 4154/4164	NURS 4443/4453

RN students will be considered as a separate group for admission purposes.

### Advanced Placement for Licensed Practical Nurses and Licensed Psychiatric Technical Nurses

Applicants for advanced placement into the LPN/LPTN to B.S.N. track must meet the following requirements:

1. Admission requirements of the College of Education and Health Professions
2. Admission requirements of the Eleanor Mann School of Nursing
3. Completed an Arkansas State Board approved LPN or LPTN program or an NLNAC accredited out-of-state program
4. Have nursing courses reviewed for transfer credit by the School of Nursing
5. Provide proof of and maintain an unencumbered license to practice as an LPN or LPTN in the state of Arkansas
6. Advanced placement may vary based on the length of time since completion of the LPN or LPTN and the length of time of (or since) nursing employment.
7. Students may receive credit for 12 hrs in the nursing program through validation procedures. The student may validate NURS 3634/NURS 3643 through the NLN Profile II Book I examination. They may validate NURS 3042L, NURS 3312, NURS 3032, NURS 3422 and NURS 3423 through successful completion of the remaining courses in Level I of the professional program of study. These courses will be held in escrow. The student will receive credit for escrowed courses upon successful completion of the professional program of study.

### Performance Standards for Admission to and Progression in the Professional Program of Study

Professional nurses must have the knowledge and ability to completely assist the biological, psychological, intellectual, social, and spiritual dimensions of the client. After acceptance, but before admission to the B.S.N. program, students must show documentation for current certification in cardiopulmonary resuscitation (CPR) for health-care providers (American Heart Association course). This requires the ability to successfully complete both the written and practical tests for certification. In addition, students admitted to the Eleanor Mann School of Nursing must meet the following abilities and expectations during their enrollment in the program.

1. **Critical Thinking.** Student nurses must be able to analyze data, explore interpretations, generate hypotheses, select actions and evaluate outcomes related to nursing care of clients. In addition, applicants must be able to problem solve.
2. **Psychomotor.** Student nurses must be able to perform the following:

- a. assess clients through auscultation, percussion, palpation, and other diagnostic maneuvers;
  - b. manipulate equipment necessary to assist the client to desired outcomes;
  - c. lift and move clients to provide safe care and emergency treatment;
  - d. perform cardiopulmonary resuscitation (CPR);
  - e. perform independently of others;
  - f. possess cognitive abilities to measure, calculate dosages, reason, analyze, and synthesize.
3. **Communication.** Student nurses must be able to perform the following:
    - a. receive, translate, and import information by oral and written means according to standards of the English language and safe nursing practice;
    - b. speak, hear, visually observe clients and interpret non-verbal behavior;
    - c. effectively communicate verbally and in writing with all health care providers.
  4. **Behavioral/Social Attributes.** Students are required to have social skills and emotional health sufficient to provide safe, therapeutic care. The ability to function in stressful environments and meet physically and mentally stressful demands is essential.
 

The study and practice of nursing requires strong emotional, intellectual, and physical capabilities. It is important for prospective nursing students to have a realistic view of the demanding curriculum before they decide to pursue the degree. Prospective students are encouraged to contact the School of Nursing if they have questions about their ability to function in the clinical settings.

### Progression, Probation, Suspension, Withdrawal and Dismissal

1. Any nursing course in which a letter grade of "D" or lower is received must be repeated before the student progresses. (Repetition of courses depends on clinical space available.)
2. Students who receive a grade of "D" or lower or withdraw from any nursing course for any reason must petition the School's Admission and Advisement Committee for readmission to the nursing program. Final decisions for readmission rests with the nursing faculty.
3. Students must achieve a 70% exam average in every course in the professional program of study. Failure to do so in a course will result in failure of the course and possible dismissal from the program.
4. Junior Progression Exam Requirement (Students should contact their adviser for details.)
5. Senior Progression Exam Requirement (Students should contact their adviser for details.)
6. Students are limited to one petition for readmission. Readmission is limited by space availability.
7. Students who are dismissed from any clinical course will be suspended from all clinical courses until the dismissal is reviewed by the faculty of the School. (Suspension means the student will not be permitted to attend any clinical assignment until the School reviews the issue.)

### Readmission Policies

Any student whose enrollment in the professional program of study has been interrupted may seek readmission following the steps below:

1. Seek readmission into the University of Arkansas (if applicable).



2. Complete Readmission Application to the School of Nursing the semester prior to the semester of intended re-entry into the program.(Readmission is limited by space availability.)
3. If the student's enrollment was interrupted to attend another college, the University's transfer student admission policies would also apply for readmission.

### Exit Policies

1. Students must complete the requirements for the degree within five years of enrolling in the first upper-division nursing course. If the student does not complete the Professional Program of Study within the five-year limit, nursing credits must be reevaluated.
2. All University of Arkansas and College of Education and Health Professions requirements must be met.

### Requirements for Bachelor of Science in Nursing

	HOURS
General Studies	63
ENGL 1013, Composition I	
ENGL 1023, Composition II	
ENGL 2003, Advanced Composition (exemption by examination or credit in ENGL 2013 or grade of at least "B" in ENGL 1013 and "A" in ENGL 1023 at Fayetteville campus)	
COMM 1313, Fundamentals of Communication Literature (3 hrs) World Literature recommended	
Fine Arts/Humanities Elective (3 hrs) to meet State Core	
PHIL 2103 or PHIL 3103, Ethics	
HIST 2003 or HIST 2013, or PLSC 2003	
PSYC 2003, General Psychology	
SOCI 2003, General Sociology or	
SOCI 2013 or ANTH 1023	
HESC 1403, Lifespan Development	
MATH 1203, College Algebra	
PSYC 2013, Introduction to Statistics for Psych	
NURS 3013, Computers in Health Care Systems	
CHEM 1074/10711, Fundamentals of Chemistry	
BIOL 1543/BIOL 1541L, Principles of Biology	
MBIO 2013/2011L, General Microbiology	
ZOOL 2213/2211L, Human Physiology	
ZOOL 2443/2441L, Human Anatomy (4 hours of biological science are a prerequisite unless exempt)	
Professional Nursing Program	65
Level I	
NURS 3022, Intro to Professional Nursing Concepts	
NURS 3032, Therapeutic Comm.	
NURS 3042L, Professional Nursing Skills: Basic	
NURS 3212, Teaching and Health Promotion	
NURS 3221, Professional Role Implementation I: Teacher	
NURS 3312, Pharmacology	
NURS 3314, Pathophysiology	
NURS 3321, Health Assessment	
NURS 3422, Nursing Concepts: Foundations of Professional Practice	
NURS 3423, Professional Role Implementation II: Caregiver	
Level II	
NURS 3634, Nursing Concepts: Adult Health and Illness	
NURS 3643, Professional Role Implementation III: Caregiver	
NURS 3841L, Professional Nursing Skills: Advanced	
NURS 3842, Research in Nursing	
NURS 3742, Nursing Concepts: Mental Health/Illness	

NURS 3752, Professional Role Implementation IV: Caregiver  
 NURS 4154, Nursing Concepts: Children and Family  
 NURS 4164, Professional Role Implementation V: Teacher  
 NURS 4242, Management in Nursing  
 NURS 4263, Nursing Concepts: Older Adult Health/Illness  
 NURS 4273, Professional Role Implementation VI: Manager

#### Level III

NURS 4443, Nursing Concepts: Critical Care  
 NURS 4453, Professional Role Implementation VII:  
 Role Synthesis  
 NURS 4603, Nursing Concepts:Communities  
 NURS 4613, Professional Role Implementation VIII:  
 Role Synthesis  
 NURS 4712, Seminar in Nursing

#### Total for Nursing

128

**NOTE:** In addition to the program requirements, students must meet the University and College graduation requirements. This curriculum is subject to change to comply with national accreditation and the Arkansas State Board of Nursing Standards.

SEE PAGE 316 FOR ELEANOR MANN SCHOOL OF NURSING (NURS) COURSES

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### DEPARTMENT OF REHABILITATION, HUMAN RESOURCES AND COMMUNICATION DISORDERS (RHRC)

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Barbara E. Hinton  
 Department Head  
 GRAD 100  
 575-4758  
 E-Mail: bhinton@uark.edu

Ok. D. Park  
 Coordinator of Graduate Studies  
 GRAD 112  
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The department of rehabilitation, human resources and communication disorders offers the B.S.E. with an emphasis in vocational education and the B.S.E. in communication disorders. An M.Ed. in adult education, M.Ed. in vocational education, M.A.T. in vocational education, M.S. with an emphasis in speech pathology, M.S. in rehabilitation, Ed.S. in adult education, Ed.S. in vocational education, Ed.D. in adult education, Ed.D. in vocational education, and Ph.D. in rehabilitation are also offered.

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### ADULT EDUCATION (ADED)

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- Professors Dutton, Hinton
- Associate Professor Lyle
- Assistant Professors Brooks, Nafukho, Thompson (D.)
- Visiting Assistant Professor Carder
- Adjunct Assistant Professor Lofton

SEE PAGE 249 FOR ADULT EDUCATION (ADED) COURSES



**COMMUNICATION DISORDERS (CDIS)**

201 Speech and Hearing Clinic  
575-4509

- Professor Shadden
- Associate Professor Toner
- Assistant Professors Henrickson, Hagstrom
- Research Associate Aslin
- Instructors McGehee

An undergraduate major in communication disorders leads to the B.S.E. degree and prepares students for graduate studies (master's level) in speech-language pathology and audiology.

The minimum requirements for all students in the College of Education and Health Professions are listed under general studies on page 173.

**Admission to the B.S.E. Major Degree Program in Communication Disorders**

All students declaring an undergraduate major in communication disorders are accepted as tentative candidates to the undergraduate program. However, formal admission to the program is limited. Students must apply for admission to the undergraduate B.S.E. degree program in communication disorders prior to taking junior- and senior-level classes in the major. Requirements for admission include the following:

- Completion of the admission application form.
- Junior status at the time that 3000-level courses will be taken.
- An overall minimum GPA of 3.0 over the first four semesters (50-60 hours) of college course work. Under special circumstances, students may petition the faculty to waive the 3.0 GPA requirement.
- Satisfactory completion of an admission interview with designated members of the faculty.

Students who do not meet admission criteria for the B.S. E. degree program in communication disorders in any given year may reapply in subsequent years.

**Requirements for the program in Communication Disorders**

	HOURS
University Core and General Studies, page 44, 173	47-50
Communication Disorders Core	38
CDIS 2253, Introduction to Communicative Disorders	
CDIS 3103, Introduction to Audiology	
CDIS 3124, Normal Phonological and Articulatory Processes and CDIS 3120L, Phonetic Transcription Lab	
CDIS 3203, Articulation and Voice Disorders	
CDIS 3213, Anatomy and Physiology of Speech and Hearing Mechanisms	
CDIS 3223, Language Development in Children	
CDIS 3234, Introduction to Clinical Practice and CDIS 3230L, Clinical Observation Laboratory	
CDIS 4133, Introduction to Aural Rehab	
CDIS 4213, Introduction to Speech and Hearing Science	
CDIS 4223, Language Disorders in Children	
CDIS 4253, Neurological Bases of Communication	
CDIS 4273, Communication Behavior and Aging	
Electives to meet 124 hours	36-39

**Total for Communication Disorders** 124

SEE PAGE 262 FOR COMMUNICATION DISORDERS (CDIS) COURSES

**REHABILITATION (RHAB)**

GRAD 100  
575-4758

- University Professor Roessler
- Professors Anderson, Cook, Watson
- Research Professors Boone, Schroedel
- Assistant Professor Williams
- Research Assistant Professors Cantrell, Capella, Cochran, Miller, Wheeler- Scruggs

SEE PAGE 328 FOR REHABILITATION (RHAB) COURSES

**VOCATIONAL EDUCATION (VOED)**

- Professors Biggs, Hinton, Thompson (C.)
- Associate Professors De Vore, Orr, Park
- Assistant Professors Brooks, Nafukho, Thompson (D.)
- Visiting Assistant Professor Carder
- Instructors Snow, Wills

The University of Arkansas has been approved by the State Board for Workforce Education for the preparation of teachers, supervisors, and administrators in vocational education.

The two areas of concentrations in vocational education are as follows:

1. Business Education (BUED)
2. Family and Consumer Sciences (FCSE)

**Professional Pre-Education Core Requirements IN VOCATIONAL EDUCATION**

	HOURS
Curriculum and Instruction	9
CIED 1002, Introduction to Education	
CIED 1011, Intro to Education Practicum	
CIED 3023, Survey of Exceptionalities	
CIED 3033, Classroom Learning Theory	
Educational Technology	3
EETC 2001, Educational Technology	
EETC 2002L, Educational Technology Lab	
Vocational Education	6
VOED 3001, Orientation to VOED	
VOED 4002, Intro to Professionalism	
VOED 4013, Presentation Techniques	
General Studies Requirements	56
The general requirements for all under-graduate programs in the College of Education and Health Professions are found under general studies.	
Technical Studies Requirements	50
Technical studies requirements for students majoring in business education and family and consumer science education are listed below.	

**Professional Education Requirements for Master of Arts in Teaching (M.A.T.)** 33

See the *Graduate School Catalog*.

SEE PAGE 333 FOR VOCATIONAL EDUCATION (VOED) COURSES.

**BUSINESS EDUCATION (BUED)**

Advisers: Fredrick Muyia Nafukho, Ok Park  
 Graduate Education Building  
 575-4758 or 575-4759

Completion of the Bachelor of Science in Education degree has two concentrations: non-licensure and licensure. Requirements for initial teacher licensure may be met by completing the B.S.E. and the Master of Arts in Teaching (M.A.T.) (See the Graduate School Catalog.) Refer to the College academic regulations, admission process for initial licensure for other requirements.

**Basic Plan**

In addition to the general studies (see note) and the 18-hour Professional Pre-Education Core, the following courses are required for a concentration in business education and upon completion of the Master of Arts in Teaching (M.A.T.) degree, will qualify the graduate for the teaching of business education courses excluding marketing and computer technology.

	HOURS
ACCT 2013, ACCT 2023, Introduction to Accounting Information I and II	6
BLAW 2013, Legal Environment of Business	3
ISYS 1121L, Intro to Computer Info Systems Lab	1
ISYS 2232, Business Info Systems	2
VOED 480V Problems in VOED (Keyboarding II)	3
ISYS 3000 level or above	3
VOED 480V Problems in VOED (Word Processing)	3
MGMT 1033, Introduction to Business or higher	3
MGMT 3563, Mgmt Concepts/Orgn Behavior or MKTT 3433, Principles of Marketing	3
VOED 3112, Vocational Student Orgn	2
VOED 380V, Supervised Work Experience	6
VOED 4122, Leadership Dev.	2
VOED 4303, Business Comm in Education	3
Business electives	10
<b>Total</b>	<b>50</b>

**NOTE:** ECON 2143 will satisfy the economics requirement in general studies and the prerequisite requirement for MKTT 3433. The minimum number of hours required to receive a baccalaureate degree at the University of Arkansas is 124 semester hours.

**Computer Technology**

The completion of the basic plan, including the Master of Arts in Teaching (M.A.T.), plus the following courses qualify the graduate for teaching computer technology courses:

	HOURS
Computer programming course	3
Computer elective must be at the 2000 level or above	3

**Marketing**

See adviser for requirements.

**FAMILY AND CONSUMER SCIENCES EDUCATION (FCSE)**

Adviser:  
 Cecelia K. Thompson  
 120 Graduate Education Building  
 575-2581

Students pursuing the Bachelor of Science in Education degree may select the family and consumer sciences education program concentra-

tion as a field of specialization in vocational education. Requirements for initial licensure may be met by completion of the B.S.E. and the Master of Arts in Teaching (M.A.T.) See the *Graduate School Catalog*.

In addition to the general studies and the 18-hour Professional Pre-Education Core, the following courses are required for a concentration in family and consumer sciences education.

	HOURS
Technical Requirements	55-56
HESC 1013, HESC 1023, HESC 2053	
Clothing and Textiles	9
HESC 2112/2111L, HESC 2123, HESC 1213	
or HESC 3204, Foods and Nutrition	9-10
HESC 1403, HESC 3402/3401L, HESC 2413	
and HESC 4453, Human Development	12
HESC 4753, HESC 3763L, Consumer Education	
and Management	9
HESC 1501, Orientation to Human Env. Sciences	1
CHEM 1074/1071L, Fundamentals of Chemistry	5
CHEM 2613/2611L, Organic Physiological Chemistry	4
ARTS 1003, Art Studio	3

**NOTE:** The minimum number of hours required to receive a baccalaureate degree at the University of Arkansas is 124 semester hours.

For professional education requirements for Master of Arts in Teaching (M.A.T.), see the *Graduate School Catalog* or see page 171 in this catalog.

**INDUSTRIAL AND TECHNICAL EDUCATION (ITED)**

Advisers:  
 Jack B. DeVore, Jr.  
 102 Graduate Education Building  
 575-7285  
 Phil Gerke  
 117 Graduate Education Building  
 575-4690  
 James E. Snow  
 103 Graduate Education Building  
 575-7354  
 Dale E. Thompson  
 111 Graduate Education Building  
 575-6640  
 Fred A. Wills  
 109 Graduate Education Building  
 575-5114

Students pursuing the Bachelor of Science in Education degree may select the industrial and technical education program, which has two concentrations designed for working adults. Students seeking entry to either of these concentrations should contact department faculty, administrators, or the Boyer Advising Center.

**Performanced-Based Teacher Education (PBTE) Concentration**

This concentration should be selected by incumbent (in service) trade and technical instructors who desire to obtain a Bachelor of Science in Education degree or become certified as a master instructor in the post-secondary vocational and secondary school systems. PBTE Concentration utilizes the Performance-Based Teacher Education modules and is field-based.

### Human Resource Development (HRD) Concentration

This concentration is designed for adult learners already in the workforce with several years of work experience and permits credit for documented experiential learning. This plan is an extended concentration offered by the University of Arkansas, Fayetteville, at off-campus locations via distance learning technology on a two-year rotation plan. Details can be found on the Web at <<http://www.uark.edu/hrd>>.

### Residency Requirement for PBTE Concentration

The residency requirement for the PBTE Concentration specifies that at least six semester hours of course work must be completed on campus, with an additional six semester hours taken at a location in the state taught by UA, Fayetteville, faculty.

### Human Resource Development Concentration

	HOURS
Technical Requirements	33
Credit may be earned through documented prior work and experiential learning. Applicants will be required to present extensive portfolio documentation of experiential learning and prior work-related experience following a standardized format as suggested by the Council for the Advancement of Experiential Learning (CAEL).	
Credit may be granted upon, but not limited to, the following: Senior employee-level work experience in business and industry, armed forces, prior training and formal learning experiences, ACE/PONSI credits, NOCTI testing, SHRM certification, and CEUs.	
Applicants must qualify for at least 15 hours of experiential learning credit. Students not qualifying for the full 33 hrs of experiential credit will be required to take courses from the approved HRD list.	
Human Resource Development Professional Courses	33
VAED 3113, VAED 3123, VAED 3133, VAED 3213, VAED 4113, VAED 4133, VAED 4213, VAED 4233	24
ITED 459V, Industrial Internship (Workplace based)	12
General Studies Requirements	55
<b>Total</b>	<b>124</b>

SEE PAGE 302 FOR INDUSTRIAL AND TECHNICAL EDUCATION (ITED) COURSES AND PAGE 333 FOR VOCATIONAL AND ADULT EDUCATION (VAED) COURSES

### COLLEGE OF EDUCATION AND HEALTH PROFESSIONS HONORS PROGRAM (HNED)

Boyer Center for Student Services  
8 Peabody Hall  
575-4203  
E-Mail: [bcss@uark.edu](mailto:bcss@uark.edu)

The College of Education and Health Professions honors program is designed to enable undergraduate students in the College who have demonstrated potential for outstanding scholastic achievement an opportunity to broaden and deepen their liberal and professional education. Honors Program students are also eligible to take honors courses in other colleges.

The experience in the honors program includes, but is not limited to, enrollment in honors courses, an honors seminar, and a required undergraduate thesis/project.

Incoming freshmen who meet one of the following three require-

ments will be invited to participate in the honors program; however, each student must file a formal application to be enrolled.

1. An ACT composite score of 28 or better
2. An SAT score of 1150
3. Rank in the top 5% of their high school graduating class.

Eligibility for continued enrollment in the honors program will be based on the following cumulative minimum grade-point averages.

1. At the end of freshman year (30 hours) - 3.25 GPA
2. At the end of sophomore year (59 hours) - 3.37 GPA
3. At the end of the junior year (93 hours) - 3.50 GPA
4. At graduation - 3.50 GPA

It is desirable and strongly advised that students enter the honors program as freshmen. However, other students may make application to participate if they meet requirements for admission and for continued enrollment eligibility. They must still meet all program requirements before graduation.

Transfer students may enter the honors program based on the admission and eligibility requirements above and their cumulative grade-point average from the previous college.

At the end of each semester, the director of the College of Education and Health Professions honors program will review the academic records of all enrolled honors students to determine whether each one has the cumulative grade-point average to continue in the program. If a student has become ineligible, he or she will be sent a letter regarding status and requiring the student to drop all honors courses for which he or she is registered the following semester. The ineligible student's file will be flagged "probationary status." An honors student may stay on probationary status for only one semester without being dropped from the honors program. At the end of the probationary semester, the student's cumulative grade-point average will be reviewed. The student will be re-instated to good standing in the honors program or dropped permanently from the program.

The course and grade requirements for completion of the College of Education and Health Professions honors program are as follows:

1. Completion of 12 hours of honors credit. Only six of which may be taken outside the College of Education and Health Professions. The following courses are required:
  - 6 hours of Honors sections of core classes taken from Arts and Sciences
  - HNED 3001H, Honors Education Thesis Tutorial
  - HNED 4003H, Honors Education Thesis/Project
2. Graduation with a minimum GPA of 3.50.

**NOTE:** Successful completion of the College Honors program is different from graduation with honors. Please refer to the previous section on graduating with honors.

SEE PAGE 298 FOR COLLEGE OF EDUCATION AND HEALTH PROFESSIONS HONORS PROGRAM (HNED) COURSES

# College of Engineering

## Dean of the College

4183 Bell Engineering Center  
575-7455

## Associate Deans

4188 Bell Engineering Center  
575-6010

## Assistant Deans

3189 Bell Engineering Center  
575-6012

## Dean

Neil M. Schmitt, Ph.D., Interim Dean  
Southern Methodist University

## Associate Deans

John J. Schemmel, Ph.D.  
North Carolina State University

Jim L. Gattis, Ph.D.  
Purdue University

William D. Brown, Ph.D.  
University of New Mexico

## Assistant Deans

William K. Warnock, Ph.D.  
Oklahoma State University

Thomas Carter III, B.S.  
Henderson State University

## Undergraduate Programs and Services

### Student Information

3188 Bell Engineering Center  
575-3051

### Recruitment and Retention

3188 Bell Engineering Center  
575-3051

### Scholarship Officer

4188 Bell Engineering Center  
575-4092

### Cooperative Education

607 Arkansas Union  
575-6265

### Engineering Research Center

575-6407

## World Wide Web

<http://www.engr.uark.edu>

**E-Mail:** [nms@engr.uark.edu](mailto:nms@engr.uark.edu)

## ENGINEERING ADVISORY COUNCIL

### Bami Bastani

ANADIGICS, Inc.  
Warren, New Jersey

### R.R. Baxter

Baxter Associates, Inc.  
Palatine, Illinois

### O.T. Beasley

(Ret.) Chemical Market Associates, Inc.  
Houston, Texas

### George Combs

Combs Equity Management, Inc.  
Little Rock, Arkansas

### Ansel L. Condray

Exxon Mobil International, Limited  
London, England

### William L. Cravens

Alltel Information Services, Inc.  
Little Rock, Arkansas

### Robert Davidson

ABF Freight Systems, Inc.  
Fort Smith, Arkansas

### J. Cliff Eason

(Ret.) Southwestern Bell Telephone  
San Antonio, Texas

### David D. Foust

(Ret.) Seneca Wire & Manufacturing Co.  
Rogers, Arkansas

### Charles B. Friley

The North American Coal Co.  
Dallas, Texas

### Mike Gilliam

SBC Communications, Inc.  
San Antonio, Texas

### Mary L. Good

Donaghey College of Information Science and Systems Eng.  
University of Arkansas at Little Rock  
Little Rock, Arkansas

### Wesley Haisty

(Ret.) Detroit Tool and Engineering Co.  
Lebanon, Missouri

### Edward M. Harvey

Harvey Industries  
Little Rock, Arkansas

### James S. Keel Jr.

Keel Enterprises  
Cincinnati, Ohio



**Kenneth W. Keltner**

(Ret.) Southwestern Bell Telephone  
Little Rock, Arkansas

**Jack L. King**

(Ret.) Ogelthorpe Power Corporation  
Roswell, Georgia

**Rodger S. Kline**

Axiom Corporation  
Little Rock, Arkansas

**John R. Marshall**

Duquesne Light Co.  
Pittsburg, Pennsylvania

**Ralph E. Martin**

Petro Fac, Inc.  
Tyler, Texas

**Ray Owen**

Mission Production Co.  
Houston, Texas

**Kirk Pond**

Fairchild Semiconductor  
South Portland, Maine

**Larry Stephens**

Mid-South Engineering  
Hot Springs, Arkansas

**W. T. Stephens**

(Ret.) MacMillan Bloedel Limited  
Greenwood Village, Colorado

**Gus Vratsinas**

Vratsinas Construction Co.  
Little Rock, Arkansas

**Roger L. Wright**

Eastman Chemical Co.  
Batesville, Arkansas

**Thomas J. Wright**

Entergy  
New Orleans, Louisiana

**Neil M. Schmitt**

UA College of Engineering  
Fayetteville, Arkansas

**MISSION STATEMENT AND HISTORY**

The College of Engineering adds personal, social and economic value through engineering education. Value is added through four separate but highly integrated activities:

- Undergraduate Education
  - Graduate Education and Research
  - Continuing Education and Technology Transfer
  - Technology-based Business Incubation and Job Creation
- Programmatic activities focus largely on six areas of emphasis:
- Biological, Chemical and Food Processing
  - Database and Telecommunications
  - Electronics Manufacturing
  - Environmental and Ecosystems Analysis
  - Materials and Manufacturing
  - Transportation, Logistics and Infrastructure

Extensive information about the College of Engineering is available in the form of two-page summaries that may be downloaded from the college publications Web page: <<http://www/engr.uark.edu>>.

These summaries provide overviews of each programmatic activity and area of emphasis and include information about faculty, facilities, programs of study, advisory groups, centers, research capabilities, special programs, distance education, professional development, and opportunities for partnerships with the college.

**STATEMENT OF PURPOSE**

Recognizing that the University of Arkansas, Fayetteville, is a land-grant institution with consequent responsibilities in teaching, research and service, and realizing that these are mutually dependent and necessary responsibilities, the College of Engineering adopts and seeks to fulfill the following statements of purpose.

**Undergraduate Education**

To offer a high-quality course of instruction involving classroom, laboratory and extracurricular activities that will result in professionals qualified to begin careers in the field of engineering and prepared to assume responsible places of leadership in society.

**Graduate Education**

To offer state-of-the-art coursework and research experiences which result in all graduates being capable of independent analysis and design, and all Ph.D. graduates capable of extending the state-of-the-art in their areas of expertise.

**Continuing Education**

To provide local, regional, national and international seminars, symposia, short courses and credit courses to engineers and others in the technical community to help them further their formal education and keep abreast of new developments in technology.

**Technology Development**

To assist actively and vigorously in the growth and development of the State of Arkansas and the nation by performing research and development of state-of-the-art technology, by updating the existing technology within industrial circles, by providing educational support services and by attracting and creating new industry.

**External Relations**

To communicate effectively with the college's various constituencies to establish and maintain long-term relationships which lead to increased support for quality programs in teaching, research and service.

**Internal Relations**

To actively involve engineering faculty in University, college and department governance and related functions.

**HISTORICAL BENCHMARKS**

As the only comprehensive engineering program in Arkansas, the College of Engineering offers undergraduate, graduate and doctoral degrees through seven academic departments. UA engineering programs have been continuously accredited by the Accreditation Board of Engineering and Technology (ABET) since 1936.

The college has a long and distinguished history —

1871 the University was established

1873 the first courses in civil engineering were offered

1888 the first civil engineering degree was awarded

1897 a separate civil engineering department and a department of electrical engineering was established

1903 a department of mechanical engineering was established and a chemical engineering curriculum was established in the department of chemistry

1913 the College of Engineering was organized as a college of the University

1920 the Engineering Experiment Station was established by the state legislature to investigate and study engineering problems of general interest to Arkansas

- 1928 the first master's degree in engineering was awarded
- 1945 chemical engineering became part of the College of Engineering
- 1948 the departments of agricultural engineering and industrial engineering were established
- 1958 a Doctor of Philosophy degree was approved
- 1966 a curriculum in engineering science was offered
- 1975 the Engineering Extension Center was formed to provide continuing education opportunities to practicing engineers
- 1976 a computer science engineering program was initiated within the industrial engineering department
- 1980 the engineering science curriculum was merged with the mechanical engineering curriculum
- 1982 the college took possession of an empty manufacturing plant that evolved into the Engineering Research Center
- 1985 computer science engineering became a separate department and the Arkansas Center for Technology Transfer was established
- 1986 the Engineering Distance Education Center was created to offer off-campus engineering education and the GENESIS Technology Incubator was established
- 1989 The department of agricultural engineering became the department of biological and agricultural engineering
- 1991 the computer science engineering department name was changed to computer systems engineering
- 1997 the Engineering Distance Education Center was expanded to include undergraduate course offerings
- 1998 computer systems engineering merged with the computer science department housed in the J. William Fulbright College of Arts and Sciences, which created the department of computer science and computer engineering
- 2001 the biological and agricultural engineering program name was changed to biological engineering

The following educators have served the College as dean:

William N. Gladson	1913-1936
George P. Stocker	1936-1948
George F. Branigan	1948-1971
Loren R. Heiple	1971-1979
James E. Halligan	1979-1982
Neil M. Schmitt	1983-1996
Otto J. Loewer	1996-2002

## PROGRAMMATIC ACTIVITIES

### Undergraduate Education

Undergraduate education is a core mission of the College of Engineering. A full array of accredited undergraduate degrees is offered in outstanding teaching facilities and laboratories. The college faculty brings considerable industrial experience to the classroom, thus adding to the value of the formal course work. Students who graduate from any of the college's undergraduate programs can be confident that they have received an engineering education of exceptionally high quality that makes them nationally and internationally competitive in the marketplace of their respective disciplines.

### Graduate Education and Research

Graduate education and research go hand in hand and are major programmatic activities in each of the seven departments in the College of Engineering. Research coordination is achieved through the Engineering Experiment Station, which was established for that purpose by an act of the Arkansas Legislature in 1920.

The overall goal of graduate education and research in the College of Engineering is to provide engineering solutions to important problems that face our society while, at the same time, educating nationally and

internationally competitive students at the cutting edge of technology. Student involvement in research is especially important in that it helps link students to the needs of their future employers. All seven engineering departments — biological and agricultural, chemical, civil, computer science and computer engineering, electrical, industrial, and mechanical — conduct research over a broad spectrum of subjects that fall largely into the college's areas of emphasis (listed above). Funding for research comes primarily through external contracts between the college and its government and industry partners. Much of the external research funding goes to support student employees who work on the various research projects.

### Continuing Education and Technology Transfer

The College of Engineering embraces continuing education and technology transfer as programmatic activities that help meet the engineering community's need for life-long learning. In recognition of its responsibilities to the technical community of the state, the College of Engineering formed the Engineering Extension Center on July 1, 1975, to provide continuing educational services for practicing engineers.

The primary objective of this programmatic activity is to provide the very latest information required for maintaining and enhancing the technical competency of the practitioner and helping industry remain economically viable. This is accomplished through various offerings such as seminars, short courses, conferences, consulting and institutes, as well as through regular course offerings. An additional objective is to provide a productive interface among faculty, practitioners and industry.

### Technology-based Business Incubation and Job Creation

The College of Engineering is very active in promoting technology-based economic development in Arkansas and the region. The major unit involved in this programmatic activity is the GENESIS Technology Incubator. GENESIS is a national award-winning program located within the Engineering Research Center in close proximity to the college's research laboratories. Office and laboratory space in the Engineering Research Center is rented to companies that satisfy the GENESIS criteria. Companies, for a fee, have access to certain University of Arkansas resources. Companies that become part of the GENESIS program generally are developing technology-based products for the marketplace, and they need access to faculty expertise, highly specialized laboratories, and student employees. The goal of GENESIS is to help companies grow, thus adding more technology-based employment opportunities in the state and region. In fact, since its creation in 1987, GENESIS companies have created a new job in Arkansas about every four working days.

## FACILITIES AND LABORATORY FEE

### Instructional, Computer, and Laboratory Facilities

Undergraduate instruction in engineering takes place in Bell Engineering Center, Engineering Hall, and the Mechanical Engineering Building. These facilities contain state-of-the-art classrooms and instructional equipment. Undergraduate laboratories are located both on the main campus as well as at the Engineering Research Center. Laboratories offer students hands-on experience relating to the subject matter addressed in the classroom.

The College of Engineering utilizes a wide variety of computing equipment to assist in engineering education. Students have easy access to computers through general computer laboratories or computer facilities located in specialized laboratories within the college. The computers are networked so that all the computing power of the University, including the mainframe computers, can be accessed from the PCs or workstations provided for engineering students. Owning a personal computer is not required; however, it is beneficial.

### Laboratory Fee

In order to maintain the College's state-of-the-art instructional and computer laboratories each student enrolled in an engineering course is assessed a laboratory fee for that term. This fee is not only used to purchase and maintain equipment, but to operate and staff the engineering laboratories.

### Library

The books and references used by engineering students and faculty are housed principally in the University of Arkansas Mullins Library. This collection is the most useful and comprehensive engineering library in the state. Many publications pertinent to the engineering profession are being added continuously. Mullins Library is the depository for water resources papers, geological survey materials, and NASA publications, as well as other governmental and industrial series.

### Engineering Research Center

The 178,000 square foot Engineering Research Center is located approximately two miles south of the main campus. The Center provides the facilities and support services for a wide variety of research activities. The Center houses the Engineering Experiment Station through which the research of individual departments in the college is administered. Centers and Laboratories located at the Engineering Research Center include GENESIS, the High Density Electronics Center, The Arkansas Center for Technology Transfer, the Industrial Training Laboratory, the Center for Interactive Technology, the Systems Technology Laboratory, the Hydrology Laboratory, the Center for Training Transportation Professionals, and the Low-Speed Wind Tunnel Laboratory.

### Engineering Distance Education Center

In the spirit of providing quality engineering education that fits the needs of today's students, the College of Engineering offers distance education opportunities for degree-seeking graduate and undergraduate students, surveyors, registered professional engineers, and others who require on-going training.

The Engineering Distance Education Center offers the Master of Science in Engineering degree as a work-at-home series. This is a fully accredited graduate program whose candidates are engineers holding undergraduate degrees. The program is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools. The M.S.E. program is taught by the University of Arkansas College of Engineering's graduate faculty.

The M.S. in Operations Management (MSOM) degree program is available to both civilians and military personnel; classes for this program are held at the College's Graduate Resident Centers, which are located on the UA campus and at military installations in Arkansas, Tennessee and Florida.

Professional development and continuing education credits can be earned through the College of Engineering's Professional Development Center. These courses provide on-going training on technical and engineering topics for Professional Engineers, land surveyors, and others in the technical and engineering professions.

## ENGINEERING PROGRAM

Engineering is one of the most rewarding of the major professions. Engineers have been primarily responsible for the present high standard of living and for the security of the nation in times of peace and war. Engineering graduates must have a background of sound mathematics, scientific and economic principles and must be acquainted with industrial practices in their chosen field before they can assume responsibility in

the profession. Many engineering graduates become managers and leaders in the public and private sectors because of the problem-solving skills that were developed as part of an engineering education.

The freshman curriculum stresses a basic foundation in mathematics, physics and chemistry, which will be required in later years. The sophomore, junior and senior years are spent in a strong concentration on the student's chosen field, with emphasis on industrial applications of classroom and laboratory work. By the selection of electives, a student can concentrate in depth in a particular subject, have the flexibility to study several subjects, and minor in an area of interest. Provision is made for electives in the humanities and social sciences as a means of providing a well-rounded education.

The College of Engineering offers undergraduate programs leading to the Bachelor of Science (B.S.) degree, graduate programs leading to the Master of Science (M.S.) degree, and a program of advanced study leading to the Doctor of Philosophy (Ph.D.) degree. For information regarding graduate programs, consult the *Graduate School Catalog*.

## DEGREES OFFERED

The College of Engineering offers curricula accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) leading to the following seven undergraduate degrees:

- Bachelor of Science in Biological Engineering (B.S.B.E.)
- Bachelor of Science in Chemical Engineering (B.S.Ch.E.)
- Bachelor of Science in Civil Engineering (B.S.C.E.)
- Bachelor of Science in Computer Engineering (B.S.Cmp.E.)
- Bachelor of Science in Electrical Engineering (B.S.E.E.)
- Bachelor of Science in Industrial Engineering (B.S.I.E.)
- Bachelor of Science in Mechanical Engineering (B.S.M.E.)

Students can be awarded a second bachelor's degree in engineering by satisfying all the requirements for both degrees. In doing this, the student must complete a minimum of 30 semester hours of studies for the second degree, which are not used to satisfy any requirement for the first degree.

## ADMISSION REQUIREMENTS

Freshmen admitted to the University of Arkansas, Fayetteville, are eligible to enroll in the College of Engineering.

### Computer Skills

Future students are strongly encouraged to take a one-year high school course in basic computer skills, which should include at a minimum: 1) basic use of a common operating system, 2) word processing, and 3) use of a spread sheet. All engineering departments either recommend or require that incoming students deficient in these skills take a specified remedial course. Taking high school courses in engineering drawing and computer programming also is beneficial and strongly encouraged.

### International Students

Before being admitted to the electrical engineering program or the computer engineering program, international students will be required to present a score of 50 or higher on the Test of Spoken English (TSE) exam and either a score of 1000 or higher on the SAT, or a score of 25 or higher on the ACT.

### Transfer of Credit

In addition to the University policies controlling the granting of credit for course work taken at other institutions, the following policies apply to students entering the College of Engineering.



1. All courses taken at another institution are subject to approval by the Dean of the College of Engineering and the head of the degree-granting department. Credit from all institutions must be approved on a course-by-course basis to ensure its acceptability in fulfilling requirements for a degree in engineering. In making this evaluation, the student may be required by the dean and/or department head to produce catalogs from the institution from which the student is transferring that contain descriptions of the courses for which credit is expected in an engineering discipline.
2. Advanced (3000- and 4000-level at the University of Arkansas) engineering courses may not normally be transferred from institutions that do not have engineering programs accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).
3. No degree credit will be granted for any course taken at another institution in which the student's grade in that course was not the equivalent of at least 2.00 on a 4.00 grading system.

### Three-Two Transfer Plan

The College of Engineering recognizes that a graduate engineer, to be of full service to his community, must be educated in the social sciences and humanities as well as in technical subjects. The practice of industry to elevate engineers to managerial and administrative positions emphasizes the desirability of a broad educational background. Likewise, most universities within Arkansas do not offer a degree in engineering. Accordingly, the College of Engineering of the University of Arkansas has entered into a cooperative program with several Arkansas "partner" universities to provide for a five-year combined course of study that leads to a Bachelor of Arts/Bachelor of Science degree from the partner university and an engineering degree from the University of Arkansas. Typically, a student spends the first three years at the partner university and then completes an engineering curriculum in two years at the University of Arkansas. After four years of study under the combined program the student is awarded the Bachelor of Arts/Bachelor of Science degree by the partner university. At the end of the fifth year, the student is awarded the Bachelor of Science in an engineering discipline by the University of Arkansas.

### COLLEGE AND DEPARTMENTAL SCHOLARSHIPS

The College of Engineering awards numerous scholarships and fellowships to entering freshmen, continuing students, transfer students, and graduate students. Most scholarships are based primarily on academic performance. However, scholarships also may be awarded on the basis of financial need and minority status. Scholarships are available from both the college and its individual departments. College scholarships are available to any engineering student, and departmental scholarships are meant for students enrolled in a particular discipline of engineering. Students must be admitted to the University of Arkansas and accepted into the College of Engineering to qualify and receive either a college or departmental scholarship. The college has a one-step application process that allows a student to be considered for all college-level scholarships. Departmental scholarship applications may be obtained from the respective departmental offices.

For more information concerning scholarship opportunities, contact the College of Engineering Scholarship Officer at (479) 575-4092 or e-mail <scholarship@enr.uark.edu>. Questions regarding minority programs should be directed to the Minority Programs Director at (479) 575-6012.

### COOPERATIVE EDUCATION

The Cooperative Education (Co-op) Program provides a unique opportunity for an engineering student to complement on-campus engineering education with professional practice in industry. A participant begins sometime after the freshman year by alternating periods on campus as a full time student with periods off-campus in industry doing engineering work with appropriate guidance and supervision from practicing engineers. Depending on the individual situation, three to five work assignments may be meshed with the undergraduate academic work on a year-round basis. The Co-op student often returns to the same employer for all work assignments.

The Co-op Program allows a participating student to integrate industrial experience with formal academic training, earn a substantial part or all of remaining college expenses, gain professional practice in engineering, and try a tentative career choice at a stage when change can readily be made in the academic program.

During each work period, the student registers for one hour of cooperative education, listed under General Engineering. These hours may be used to satisfy any free elective hours in the curricula. In some cases, with the consent of the department head, a student may use an advanced course to satisfy a technical elective hour.

Normally, a student is eligible to participate in the Co-op Program after completing one year of appropriate engineering study or specific entry-level course work in the chosen area of study with a minimum cumulative grade-point average of 2.25.

### HONORARY AND PROFESSIONAL ORGANIZATIONS

The following are honorary-scholarship and professional societies to which engineering students at the University of Arkansas may aspire:

- Tau Beta Pi (Engineering)
- Alpha Epsilon (Biological/Agricultural Engineering)
- Omega Chi Epsilon (Chemical Engineering)
- Chi Epsilon (Civil Engineering)
- Eta Kappa Nu (Electrical Engineering)
- Alpha Pi Mu (Industrial Engineering)
- Pi Tau Sigma (Mechanical Engineering)
- Phi Eta Sigma (freshmen)
- Phi Kappa Phi (juniors and seniors)
- Pi Mu Epsilon (Mathematics)
- Theta Tau, a professional engineering fraternity, maintains a chapter house on the campus and is active in University and College affairs
- Phi Sigma Rho, a newly established professional engineering sorority
- Alpha Chi Sigma (a professional chemistry fraternity)

Several national engineering societies are listed below and maintain student branches in the College of Engineering, each under the auspices of a professor in a related department.

- American Society of Civil Engineers
- American Society of Hispanic Engineers
- American Society of Mechanical Engineers
- Institute of Electrical and Electronics Engineers
- Institute of Chemical Engineers
- American Society of Agricultural Engineers
- Institute of Industrial Engineers
- International Microelectronics and Packaging Society
- National Society of Black Engineers
- Society of American Military Engineers
- Society of Automotive Engineers Assoc. for Computing Machinery
- Society of Women in Engineering
- Institute of Transportation Engineers
- Transportation and Logistics Association



- American Chemical Society
- Amateur Radio Club of the University of Arkansas
- American Society of Heating, Refrigeration, and Air-Conditioning
- Solar Boat Team
- Society of Manufacturing Engineers
- American Nuclear Society
- Women in Engineering

## ACADEMIC REGULATIONS

Students are expected to keep themselves informed concerning current regulations, policies, and program requirements in their fields of study and must meet all requirements of the degree programs in which they are enrolled. Courses that are modified or added to a curriculum and that are incorporated into the curriculum at a level beyond that at which a student is enrolled may become graduation requirements for that student. Courses that are incorporated into the curriculum at a level lower than the one at which the student is enrolled are not required for that student.

### Eligibility

Only students enrolled in the College of Engineering or enrolled in programs in which curricula require engineering courses will be allowed to take engineering courses. Exceptions to this requirement must be approved by the dean of engineering. This does not apply to graduate students.

### Pre-Professional Program

Engineering students follow essentially the same schedule of courses during the freshman year regardless of their intended field of specialization. Certain courses normally taken in the first year comprise the pre-professional curriculum.

The pre-professional curriculum consists of the following courses:

	HOURS
ENGL 1013, Composition I	3
ENGL 1023, Technical Composition II	3
CHEM 1103, CHEM 1101L, CHEM 1123, CHEM 1121L, (University Chemistry I & II and Labs)	8
MATH 2554, Calculus I	4
MATH 2564, Calculus II	4
<b>Total semester hours</b>	<b>22</b>

Satisfactory completion of the pre-professional curriculum is a prerequisite for enrollment in any 2000-level or higher engineering course. Satisfactory completion is defined as a grade of "C" or better in each course or, alternatively, a grade-point average of at least 2.20 for the courses comprising the pre-professional curriculum. Some departments have higher requirements and those are described in the following paragraph. If courses are repeated, all attempts are included in the computation of the grade-point average.

Additional courses are included in the pre-professional curriculum for some engineering programs.

- Electrical engineering students must complete PHYS 2054/2050L, Univ. Physics I (and laboratory) in addition to the above college pre-professional requirements.
- Industrial engineering students must complete INEG 1103, Principles of Industrial Engineering rather than CHEM 1123/1121L in the college pre-professional requirements.
- Computer engineering students must complete CENG 1113/1111L, Intro. to Computers, rather than CHEM 1123/1121L in the college pre-professional requirements and CENG 1123/1121L, Intro. to Programming.

Satisfactory completion for electrical engineering and industrial engineering students is defined as a grade of "C" or better in each

course and a grade-point average of at least 2.50 for the courses comprising the pre-professional curriculum. Satisfactory completion for computer engineering students is defined as a grade of "C" or better in each course and a grade-point average of at least 2.75 for the courses comprising the pre-professional curriculum. If courses are repeated, the best attempt is used in computing the grade-point average.

Students who enroll in 2000-level or higher engineering courses without satisfactorily completing the pre-professional program will be administratively dropped from those courses. Limited exceptions can be made by the department head with the approval of the dean when extenuating circumstances exist that are beyond the control of the student.

During the second, third, and fourth years of work the student pursues a prescribed curriculum of technical and non-technical courses as preparation for professional practice in a chosen engineering field.

### Honors Program

The College of Engineering has established an honors program to challenge superior students with a more in-depth academic program and research experience and to provide a structure for working more closely with faculty members and other students in a team environment. An honors program is highly recommended for individuals planning academic or research related careers that require considerable critical and original independent thinking. Admission requirements for the College's Honors Program are consistent with those for entering the University's Honors College, an ACT of 28 or better and a high school grade point average of 3.5 or better.

Students must formally declare their desire to enter the Honors Program. Once accepted into the program a student must complete a minimum of 12 hours of honors credit, of which a minimum of 6 hours must be in the home department, of which a minimum of 3 hours must be non-thesis work and a minimum of 3 hours must be thesis work. To retain status in the Honors Program, a student must maintain a minimum cumulative GPA (for all course work, computed at the end of the spring semester) of 3.25. To receive honors distinction at graduation, a student must hold a cumulative GPA of 3.50 or better (for all course work, computed at graduation). Students with a GPA between 3.25 and 3.50 do not receive honors distinction at graduation.

### State Minimum Core, Humanities and Social Sciences Requirements

Every student seeking a baccalaureate degree from the College of Engineering must satisfy the University courses that qualify for the State Minimum Core requirements and the humanities and social sciences requirements of the College of Engineering. The University Core requirements for the University of Arkansas are listed on page 44. Every student in the College of Engineering is required to complete a minimum of 18 semester hours in the humanities and social sciences. Six semester hours must be at the 3000-level or above. A list of approved upper-level humanities/social science courses is available in departmental offices and the dean's office.

No more than nine semester hours from any single discipline may be presented for degree credit. To meet the University Core requirements, the total number of hours (both upper level and lower level) in the fine arts/humanities courses must be at least six, and the social science hours must total at least nine (in addition to the U.S. history or government requirement). The six hours of courses at the 3000-level or above may be in the fine arts/humanities area, the social science area, or divided between the two areas. Since some of the humanities/social science courses are specified in some of the curricula, e.g., ECON 2143 in chemical, industrial, and mechanical engineering, the student should consult the curriculum of the department in which he/she is enrolled prior to selecting upper-level electives.

## Specific University Core Requirements for Engineering Students

	HOURS
English	6
ENGL 1013, Composition I	
ENGL 1023, Technical Comp. II (ENGL 1023, Composition II, may be taken in lieu of Technical Composition II.)	
U.S. History or Government	3
Select from list on page 44	
Mathematics	4
MATH 2554, Calculus I	4
Science	8
PHYS 2054/2050L, Univ Physics I	
PHYS 2074/2070L, Univ Physics II	
Fine Arts/Humanities	6
Select from list on page 44 and from list of approved upper-level humanities/social science courses. (See adviser.)	
Social Sciences	9

## Special Courses

The curricula outlined on the following pages will be followed by the majority of engineering students. There are, however, courses in several departments, such as English, Western civilization, and mathematics, for students who qualify for honors courses. For students not ready to pursue the regular courses in the engineering curriculum, certain preparatory courses in English, mathematics, and chemistry are offered on the basis of placement scores.

## College Policy on Academic Ethics

The purpose of this policy statement is to define and encourage a uniform application of rules and regulations regarding academic ethics throughout the College of Engineering. Unethical conduct undermines the pursuit of the educational goals of this institution and erodes the honor, ability, and reputation of its graduates. This policy is intended to promote an academic climate wherein the full potential of each student can be realized and recognized.

## Code of Ethics

Students in the College of Engineering are obligated to comply with pertinent provisions of the Code of Ethics applicable to professional practice following graduation. The Code requires “honesty, impartiality, fairness, and equity,” and “adherence to the highest principles of ethical conduct.” Most particularly, it states that engineers shall

1. be objective and truthful in professional reports, statements, or testimony,
2. not falsify or permit misrepresentation of their academic or professional qualifications,
3. give credit for engineering work to those whom credit is due,
4. not compete unfairly with other engineers by attempting to obtain employment or advancement by improper or questionable methods,
5. avoid any act tending to promote their own interest at the expense of the dignity and integrity of the profession.

## Examples of Unethical Conduct

Pursuant to these provisions, the faculty of the College of Engineering considers the following to be specific examples of unethical conduct:

1. Submission, as one’s own, of any work prepared totally or in

part by someone else.

2. Plagiarism, i.e., the unacknowledged incorporation of another person’s work, either verbatim or in substance, in work submitted for credit.
3. Unauthorized collaboration with another person in preparing work submitted for credit.
4. Unauthorized submission, for credit, of work previously credited in another course.
5. Unauthorized alteration of work submitted for re-grading.
6. The use of unauthorized materials or aids during examinations.
7. Copying from the examination paper of another student or giving aid to, or seeking aid from, another student during an examination.
8. Using, obtaining, or attempting to obtain by any means the whole or any part of an unadministered examination, or of information pertaining thereto.
9. Taking, or attempting to take, an examination for another student, or allowing another student to take or attempt to take an examination for oneself.
10. Any conduct expressly stated to be unethical by the instructor in a particular course.
11. Aiding, abetting, or condoning unethical conduct on the part of another student.

Strict adherence to the foregoing Code of Ethics is a requirement for graduation from the College of Engineering.

## Faculty Response to Acts of Unethical Conduct

Upon becoming aware of unethical conduct, the faculty member should:

1. Collect and/or prepare appropriate documentation of the act. Examples of suitable documents are (a) reproduced copies of examinations, papers, or reports that establish unethical conduct; (b) signed written statements regarding unethical conduct by another student. (This means may be used by students to initiate action in cases of unethical conduct.)
2. Inform the student of any action to be taken in response to unethical conduct. Possible actions include (a) reduction of grade; the faculty member may decide to reduce the grade on a particular test or assignment or to assign a failing grade for the course; (b) request the College of Engineering Academic Ethics Board to rule that the student does not meet the requirements for graduation.
3. Submit a report to the College of Engineering Academic Ethics Board and give a copy of the report to the student(s) involved. Copies of documentation should accompany the report submitted to the Board. (The report will provide protection against repeated offenses in different courses.)

## Academic Ethics Board

The purpose of the Academic Ethics Board is to review the academic ethics reports submitted by faculty members and any record of previous infractions. When the circumstances warrant, the board can, by a two-thirds vote, rule that the student does not meet the requirements for graduation from the college as set forth in the engineering catalog. (The board can specify conditions under which the requirements might still be met.)

The board shall be made up of seven tenured engineering faculty members and two students. The faculty members in each department of the College of Engineering shall elect one person from the faculty in their department to serve on the board. Each board member shall serve a two-year term. The Student Engineering Council will appoint the student members to serve staggered two-year terms.

## Appeals

A student who wishes to appeal a decision by a faculty member or by the College of Engineering Academic Ethics Board may utilize existing University academic grievance procedures.

## DEGREE REQUIREMENTS

The basic requirement for a Bachelor of Science degree in engineering is 126-136 semester hours of academic work, depending on the career field chosen. Students coming from high school with adequate preparation will be able to satisfy this requirement in eight semesters; however, some students require preparatory courses and others choose to enroll in slightly lighter loads and graduate in nine or 10 semesters. Students enrolled in ROTC require an additional 19 semester hours to meet all graduation requirements and graduate in 10 semesters (5 years).

Engineering is a rapidly changing profession, and the departmental curricula are updated continuously to keep pace with these changes. Students entering under this catalog will be required to comply with such curriculum changes to earn their degree. However, the total number of semester hours required for the degree may not be increased, and all work completed in accordance with this catalog prior to the curriculum change will be applied toward the student's degree requirements. Former students of the college must meet the curriculum requirements in effect at the time of their readmission.

## Graduation Requirements

In addition to the University Core requirements for graduation (page 44), a candidate for a degree from the College of Engineering must also meet the following requirements:

Candidates for engineering degrees must meet the minimum curricular requirements established by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

A candidate for a degree from the College of Engineering must have earned a grade-point average of no less than 2.00 on all courses in the student's major area of study, all engineering courses, and all work completed at the University and presented for the degree. Grades on work taken at other colleges and presented for transfer credit must also meet this standard.

No student will be allowed to graduate if the student has "D" grades in more than 15 percent of all credit earned in this institution and presented to meet the requirements for a degree.

All ROTC classes are elective. Unspecified electives may be satisfied with any course except those courses, or prerequisite courses, needed to satisfy the student's curriculum, and those courses considered remedial to the programs in engineering.

## Minors in Other Colleges and Schools

Students in the College of Engineering may pursue an academic minor in other colleges. For example, a minor in business is popular among engineering students. For requirements regarding minors, check the catalog listing for the department offering the minor. Students must notify the College of Engineering dean's office of their intent to pursue a minor.

## GRADUATION HONORS

Students who have demonstrated exceptional academic performance in baccalaureate degree programs will be recognized at graduation by the honors designation of *Cum Laude*, *Magna Cum Laude*, or *Summa Cum Laude*. To earn this distinction, a student must meet the following criteria:

1. At least one-half of the degree course work must have been completed at the University of Arkansas, Fayetteville.

2. For *Cum Laude*, the student must rank in the top 10 percent of the college graduating class. (This corresponds to a grade-point average of 3.60.)
3. For *Magna Cum Laude*, the student must rank in the top 5 percent of the college graduating class. (This corresponds to a grade-point average of 3.75.)
4. For *Summa Cum Laude*, the student must rank in the top two percent of the college graduating class. (This corresponds to a grade-point average of 3.90.)

It is anticipated that these criteria will change as the college's new honors program evolves.

## ELECTRONICS MANUFACTURING

The College of Engineering offers a non-degree Certificate of Achievement in Electronics Manufacturing for students seeking undergraduate or graduate degrees in the College. The objectives of the program are to introduce electronics manufacturing as a career option and to prepare engineers for entry-level participation in the world electronics industry that is characterized by rapid technological change, intense global competition, and team-based project activity. The following courses are available in this program:

- CHEG 5613, Microelectronics Fabrication and Materials
- ELEG 5213, Integrated Circuit Fabrication Technology
- ELEG/MEEG 5273, Electronic Packaging
- ELEG 5293L, Integrated Circuits Fabrications Laboratory
- ELEG/MEEG 6273, Advanced Electronic Packaging
- INEG 4513/ELEG 4273, Electronics Manufacturing Process
- INEG 4533, Applications of Machine Vision
- INEG 4563, Applications of Robotics
- INEG 5423, Engineering in Global Competition
- INEG 5653, Modeling and Analysis of Semiconductor Manufacturing
- MEEG 4443, Thermal and Vibration Analysis and Testing of Electronics
- MEPH 5713/, Advanced Nanomaterials Chemistry
- MEPH 5723, Science of Nanostructures
- MGMT 5383, Intra/Entrepreneurship of Technology
- Special Topics courses as approved by Microelectronics-Photonics

## Graduate Program

A student who completes either INEG 4513/ELEG 4273 or INEG 5653, along with and any two of the other program courses, will receive the Certificate of Achievement in Electronics Manufacturing.

## GRADUATE STUDIES

The College of Engineering, in cooperation with the UA Graduate School, offers programs leading to the following 13 graduate degrees:

- Master of Science in Biological and Agricultural Engineering (M.S.B.E.)
- Master of Science in Chemical Engineering (M.S.Ch.E.)
- Master of Science in Civil Engineering (M.S.C.E.)
- Master of Science in Computer Systems Engineering (M.S.C.S.E.)
- Master of Science in Electrical Engineering (M.S.E.E.)
- Master of Science in Engineering (M.S.E.)
- Master of Science in Environmental Engineering (M.S.En.E.)
- Master of Science in Industrial Engineering (M.S.I.E.)
- Master of Science in Mechanical Engineering (M.S.M.E.)
- Master of Science in Operations Research (M.S.O.R.)
- Master of Science in Telecommunications Engineering (M.S.Tc.E.)
- Master of Science in Transportation Engineering (M.S.T.E.)
- Doctor of Philosophy in Engineering (Ph.D.)



In addition, the College of Engineering supports the following interdisciplinary graduate programs:

- Master of Science in Microelectronics-Photonics (M.S.)
- Master of Science in Cellular and Molecular Biology (M.S.)
- Doctor of Philosophy in Microelectronics-Photonics (Ph.D)
- Doctor of Philosophy in Cellular and Molecular Biology (Ph.D.)

Further information concerning these programs may be found in the *Graduate School Catalog* or in the office of the dean of the Graduate School.

## Departments, Degree Programs and Courses

### **BIOLOGICAL AND AGRICULTURAL ENGINEERING (BENG)**

Lalit Verma  
Head of the Department  
203 Engineering Hall  
575-2351

- Professors Griffis, Loewer, Verma
- Associate Professors Carrier, Costello, Li, Vories
- Assistant Professors Bajwa, Chaubey, Kim, Matlock, Osborn
- Research Professor Gardisser
- Research Associate Professors Huitink, Tacker, VanDevender
- Research Assistant Professor Murphy
- Adjunct Professor Clausen
- Adjunct Associate Professors Beitle, Deaton
- Adjunct Assistant Professors Haggard, Howell, Wimberly, Yang

Biological Engineers improve people's lives today and help assure a sustainable quality of life on Earth for tomorrow. They create solutions to problems by coupling living systems (human, environmental, food, and microbial) with the tools of engineering and biotechnology. Biological engineers: improve human health through biomedical engineering; ensure a safe, nutritious food supply and create critical, new medicines through food and bioprocess engineering; secure a healthy and safe environment through ecological engineering; and create tools to manage agriculture, the environment, and the products of biotechnology through bioresource engineering.

Biological Engineering is an ABET accredited program leading to the B.S. degree. M.S. and Ph.D. degrees are also offered. The curriculum is under the joint supervision of the dean of the College of Engineering and the dean of the Dale Bumpers College of Agricultural, Food and Life Sciences. The Bachelor of Science in Biological Engineering degree is conferred by the College of Engineering and is granted after the successful completion of 128 hours of approved course work.

The educational objectives of the Biological Engineering program are to produce graduates who 1.) effectively apply engineering to biological systems and phenomena (plants, animals, humans, microbes, and the environment) with demonstrated proficiency in basic professional and personal skills, and 2.) are well prepared for future challenges in biological engineering, life-long learning, and professional and ethical contributions to society through sustained accomplishments.

#### **Areas of Concentration**

The four areas of concentration in biological engineering are as follows:

**Biomedical Engineering** – an overview of instrumentation, physiological modeling, biomechanics, biomaterial replacement in the body, rehabilitation engineering, and assistive technology for the disabled.

This area is excellent preparation for medical, veterinary, or dental school as well as for graduate programs in biomedical engineering.

**Bioresource Engineering** – remote sensing, application of computer and satellite technology for managing agriculture, designing machines to interface with living systems.

**Ecological Engineering** – removing and preventing pollution of the environment, improving and maintaining high water quality, balancing competing interests for natural resources, stream restoration, and managing ecological services.

**Food and Bioprocess Engineering** – food processing, food safety, developing new products from biomaterials, biotechnology, bioinformatics, Proteomics, using bacteria to produce products, extracting nutrients and drugs from natural products.

Each student is required to complete 12 semester hours of approved electives in his or her area of concentration. Six of these hours must be from the biological engineering design elective courses. The remaining 6 hours are classified as technical electives and consist mainly of upper-division courses in engineering, mathematics, and the sciences as approved by the student's advisor. The department maintains a list of approved electives.

The areas of technical concentration and the recommended elective courses for each are listed here. Note that additional Biological Engineering Design Elective courses (beyond the 6 hours required) may be taken to satisfy Technical Elective requirements.

#### **Biomedical Engineering**

**NOTE:** Pre-Medical students must take CHEM 3603/3601L, Organic Chemistry I and CHEM 3613/3611L, Organic Chemistry II instead of CHEM 2613/2611L, Organic Physiological Chemistry. This requires special scheduling of courses beginning in the first sophomore semester. See your faculty adviser for this schedule plan.

##### **Design Electives:**

- BENG 4113, Risk Analysis for Biological Systems
- BENG 4123, Biosensors and Bioinstrumentation
- BENG 4203, Introduction to Biomedical Engineering
- BENG 4213, Applications of Biomedical Engineering
- BENG 4623, Biological Reactor Systems Design
- BENG 4403, Control Env Struct

##### **Technical Electives:**

- CHEM 3613, Organic Chemistry II
- CHEM 3611L, Organic Chemistry II Lab
- ZOOL 2404, Comparative Vertebrate Morphology or
- ZOOL 2443/2441L, Human Anatomy
- BIOL 4234, Comparative Physiology or
- ZOOL 2213/2211L, Human Physiology
- BIOL 2533/2531L, Cell Biology
- MBIO 4233, Microbial Genetics
- KINS 3353, Mechanics of Human Movement
- ELEG 2903, Digital Systems
- HESC 3204, Nutrition
- MEEG 3103, Mechanisms

#### **Bioresource Engineering**

##### **Design Electives:**

- BENG 4113, Risk Analysis for Biological Systems
- BENG 4123, Biosensors and Bioinstrumentation
- BENG 4703, Food and Bioprocess Engineering

##### **Technical Electives:**

- BENG 4803, Precision Agriculture
- MEEG 3103, Mechanisms
- MEEG 3113, Machine Dynamics and Control
- MEEG 3123, Design Stress Analysis
- MEEG 4123, Finite Element Methods in Mechanical Engineering
- INEG 4533, Application of Machine Vision



**Ecological Engineering****Design Electives:**

BENG 4113, Risk Analysis  
 BENG 4403, Control Env Struct  
 BENG 4623, Biological Reactor Systems Design  
 BENG 4903, Natural Resources Engineering  
 BENG 4913, Bioenvironmental Engineering  
 BENG 4923, Nonpoint Source Pollution Engineering

**Technical Electives:**

CVEG 3243, Environmental Engineering  
 CVEG 4243, Environmental Engineering Design  
 CSES 2203, Soil Science  
 CSES 4043, Environmental Impact and Fate of Pesticides  
 BENG 4803, Precision Agriculture  
 GEOG 4543, Geographic Information Systems  
 ENSC 4033, Water Quality Analysis

**Food and Bioprocess Engineering****Design Electives:**

BENG 4113, Risk Analysis for Biological Systems  
 BENG 4123, Biosensors and Bioinstrumentation  
 BENG 4623, Biological Reactor Systems Design  
 BENG 4703, Food and Bioprocess Engineering

**Technical Electives:**

FDSC 4304/4300L, Food Chemistry  
 FDSC 4124/4120L, Food Microbiology  
 FDSC 3103, Principles of Food Proc.  
 CHEM 3453/3451L, Elements of Physical Chemistry  
 MEEG 4413, Heat Transfer  
 CHEG 4423, Auto. Process Control

The following section contains the list of courses required for the Bachelor of Science in Biological Engineering degree and a suggested sequence. Some courses are not offered every semester so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

**BIOLOGICAL ENGINEERING PROGRAM**

## Freshman Year - First Semester

2 BENG 1012, Biological Engineering Design Fundamentals I  
 2 GNEG 1122, Introduction CAD  
 3 ENGL 1013, Composition I  
 3 CHEM 1103, University Chemistry I  
 4 MATH 2554, Calculus I  
 3 Humanities/Social Studies elective  
 17 semester hours

## Second Semester

2 BENG 1022, Biological Engineering Design Fundamentals II  
 3 ENGL 1023, Technical Composition II  
 3 CHEM 1123, University Chemistry II  
 1 CHEM 1121L, University Chemistry II Lab  
 4 MATH 2564, Calculus II  
 3 BIOL 1543, Principles of Biology  
 1 BIOL 1541L, Principles of Biology Lab  
 17 semester hours

## Sophomore Year - First Semester

2 BENG 2612, Quantitative Biological Engineering I  
 4 PHYS 2054, University Physics I  
 4 MATH 2574, Calculus III  
 3 MBIO 2013, General Microbiology\*  
 1 MBIO 2011L, General Microbiology Lab

3 Humanities/Social Studies Elective  
 17 semester hours

## Second Semester

2 BENG 2622, Quantitative Biological Engineering II  
 2 BENG 3712, Engr Properties of Biol Materials  
 4 PHYS 2074, University Physics II  
 3 MEEG 2003, Statics  
 3 MEEG 2403, Thermodynamics  
 3 CHEM 2613, Organic Physiological Chemistry\*\*  
 1 CHEM 2611L, Organic Physiological Chemistry Lab  
 18 semester hours

## Junior Year - First Semester

2 BENG 3722, Biological Process Eng I  
 3 ELEG 2103, Electronic Circuits  
 1 ELEG 2101L, Electronic Circuits Lab  
 3 MEEG 2013, Dynamics  
 3 CHEM 3813, Intro to Biochemistry  
 4 MATH 3404, Differential Equations  
 16 semester hours

## Second Semester

2 BENG 3732, Biological Process Eng II  
 3 BENG 3803, Mechanical Design in Biol Engr  
 3 BENG 4103, Instrumentation in Biological Engr  
 3 MEEG 3013, Mechanics of Materials  
 3 CVEG 3213, Hydraulics or MEEG 3503, Mechanics of Fluids  
 14 semester hours

## Senior Year - First Semester

3 BENG 4813, Senior Biological Engineering Design I  
 3 BENG Design elective  
 3 Technical elective  
 6 Humanities/social studies elective  
 15 semester hours

## Second Semester

2 BENG 4822, Senior Biological Eng Design II  
 3 BENG Design elective  
 6 Humanities/social studies elective  
 3 Technical elective  
 14 semester hours

**128 Total hours required**

\*Students in the Pre-Medical focus area must see faculty adviser for alternate scheduling and elective course requirements.

\*\*See note under Focus Area description for Pre-Medical.

SEE PAGE 259 FOR BIOLOGICAL ENGINEERING (BENG) COURSES

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**CHEMICAL ENGINEERING (CHEG)**


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- Distinguished Professor Havens
- Distinguished Professors Emeriti Gaddy, Thatcher
- University Professor Turpin
- Professors Babcock, Clausen, Penney, Spicer, Ulrich
- Professors Emeriti Couper, Oxford, Springer, Welker
- Research Professors Cross, Silano
- Associate Professors Ackerson, Beitle, Thoma
- Instructor Myers
- Visiting Professor Byars
- Visiting Instructors Beasley, Bushkuhl
- Adjunct Professors Muralidhara, Murphy, Siebenmorgen

Chemical engineering deals with the creation, design, operation, and optimization of processes that derive practical benefits from chemical or physical changes. The profession is quite broad and has traditionally provided the technology for: supplying energy and fuel; synthesizing materials such as plastics, chemicals, fertilizers, and pharmaceuticals; and managing environmental and safety concerns of physical and chemical processes.

Chemical engineers have a variety of traditional job opportunities in industries such as petroleum production and refining, chemical and petrochemical manufacturing, mining, pharmaceutical production, and equipment manufacturing. Job opportunities may involve research, development, design, manufacturing, sales, or teaching as professional activities. The chemical engineer can also move easily into environmental engineering, nuclear engineering, oceanography, biomedical engineering, pharmacology, medicine, or other multidisciplinary fields.

In chemical engineering, the student obtains a broad foundation in chemistry, mathematics, physics, communication skills, economics, and the humanities. Courses in material and energy balances, thermodynamics, reaction kinetics, fluid mechanics, heat and mass transfer, process control, computer methods, safety, and design provide students with the background and learning skills required of the practicing chemical engineer. The curriculum includes elective courses that enable a student to prepare for immediate employment or further study at the graduate level. The chemical engineering program also serves as an excellent preparation for medical, dental, pharmacy, or law school.

The educational objective of the Chemical Engineering undergraduate program is to provide students with an adequate foundation in science, the humanities and social sciences, engineering sciences, engineering design methods, and specific chemical engineering skills, and to thereby prepare them, in a global context, to face the challenges of today's complex and difficult problems.

The educational outcomes of our four-year curriculum are to assure that each student has had the opportunity to perform the following:

- apply a knowledge of mathematics, science, and engineering;
- identify, formulate, and solve engineering problems including, for example, development of the critical thinking process and the solution of mass and energy balances;
- design a system, component, or process to meet desired needs including, for example, determining the capital and operating costs for chemical process equipment and performing technical economic projections;
- locate, interpret, and use physical property data; when data are unavailable, design and conduct experiments, and interpret the resulting data;
- understand professional and ethical responsibility;

- use the techniques, skills, and modern engineering tools necessary for engineering practice including, for example, writing structured computer programs and using commercially available technical computer software;
- develop and use effective written and oral communication skills;
- function in multi-disciplinary teams;
- recognize the need to engage in life-long learning;
- understand the impact of engineering solutions in a global or societal context including, for example, being conscious of social, environmental, and safety concerns; and
- be familiar with contemporary issues.

These outcomes are reinforced and demonstrated in a senior capstone safety and design sequence.

The following section contains the list of courses required for the Bachelor of Science in Chemical Engineering degree and a suggested sequence. All courses are not offered every semester so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

**CHEMICAL ENGINEERING PROGRAM**

Freshman Year - First Semester

- 4 MATH 2554, Calculus I
  - 3 CHEM 1123, University Chemistry II
  - 1 CHEM 1121L, University Chemistry II Lab
  - 3 ENGL 1013, Composition I
  - 3 CHEG 1113, Intro to Chem Engr I
  - 3 HIST 2003, Hist./American People to 1877  
(HIST 2013 or PLSC 2003 may be substituted.)
- 17 semester hours

Second Semester

- 4 MATH 2564, Calculus II
  - 3 CHEG 1123, Intro to Chem Engr II
  - 3 ENGL 1023, Composition II
  - 2 CHEG 1212L, Chemical Engr Lab I
  - 3 Humanities/Social science elective
- 15 semester hours

Sophomore Year - First Semester

- 4 MATH 2574, Calculus III
  - 3 CHEM 3603, Organic Chemistry I
  - 1 CHEM 3601L, Organic Chemistry I Lab
  - 3 PHYS 2054, Univ Physics I
  - 1 PHYS 2050L, Univ Physics Lab I
  - 3 CHEG 2313 Thermodynamics of Single Component Systems
  - 1 CHEG 3221, Professional Practice Seminar
- 16 semester hours

Second Semester

- 4 MATH 3404, Differential Equations
  - 3 CHEM 3613, Organic Chemistry II
  - 1 CHEM 3611L, Organic Chemistry II Lab
  - 3 PHYS 2074, Univ Physics II
  - 1 PHYS 2070L, Univ Physics II Lab
  - 3 CHEG 2133, Fluid Mechanics
  - 3 CHEG 3323, Thermodynamics of Multicomponent Systems
- 18 semester hours

Junior Year - First Semester

- 4 CHEM Elective
- 3 MEEG 2003, Statics
- 3 CHEG 3143, Heat Transport

2 CHEG 3232L, Chemical Engr Lab II  
 3 CHEG 3253, Chem Engr Computer Methods  
 3 Humanities/Social Science Elective  
 18 semester hours

#### Second Semester

4 CHEM Elective  
 3 MEEG 3013, Mechanics of Materials  
 3 CHEG 3333, Chem Engr Reactor Design  
 3 CHEG 3153, Non-Equil Mass Transfer  
 3 ECON 2143, Basic Economics  
 (ECON 2013, Principles of Macro-economics,  
 may be substituted.  
 16 semester hours

#### Senior Year - First Semester

3 CHEG 4163, Equil Stage Mass Transfer  
 3 CHEG 4413, Chem Engr Design I  
 3 CHEG 4813 Chemical Process Safety  
 3 Technical elective  
 3 Humanities/social science elective  
 15 semester hours

#### Second Semester

2 CHEG 4332L, Chem Engr Lab III  
 3 CHEG 4443, Chem Engr Design II  
 3 ELEG 3903, Electric Circuits and Machines  
 3 CHEG 4423, Auto Process Control  
 3 Technical elective  
 3 Humanities/social science elective  
 17 semester hours

#### 132 Total hours required

### Technical Elective Options in Chemical Engineering

Each student in chemical engineering is required to complete six semester hours of technical electives. Students may select these courses from upper division (3000 and above) courses in mathematics, engineering, and the sciences with the approval of their adviser. An undergraduate education in chemical engineering provides a firm foundation for many areas of specialization. The following groups of courses can strengthen the background of a student in a particular area of expertise; note that other technical electives are included on the list approved by the Department and that not all of the following courses will meet the requirements of a technical elective.

#### Biotechnology/Biomedical Engineering

CHEG 5513, Biochemical Engineering Fundamentals  
 CHEG 5523, Bioprocess Engineering  
 CHEM 3813, Introduction to Biochemistry, or  
 CHEM 5813, Biochemistry I,  
 CHEM 5843, Biochemistry II  
 BIOL 3323/3321L, General Genetics  
 CEMB 5911, Seminar in Cellular/Molecular Biology

#### Chemical Process Safety

CHEG 5273, Corrosion Control  
 INEG 3213, Safety Engineering  
 INEG 4223, Occupational Safety and Health Standards  
 FDSC 4223, Risk Analysis for Biological Systems  
 OMTG 4303, Industrial Safety Administration

#### Environmental Engineering

CHEG 5753, Air Pollution  
 CHEG 4263, Environmental Experimental Methodology  
 CHEG 4913, Environmental Engineering Chemodynamics  
 CHEG 5273, Corrosion Control

MEEG 4813, Air Pollution Abatement  
 MEEG 4843, Environmentally Conscious Design  
 and Manufacturing  
 CVEG courses on an approved list available from the department

#### Food Process Engineering

BENG 4703/4700L, Food and Bioprocess Engineering  
 BENG 3712, Engineering Properties of Biological Materials  
 FDSC 4713/4710L, Food Product and Process Development  
 FDSC 4124, Food Microbiology  
 FDSC 4223, Risk Analysis for Biological Systems  
 FDSC 4304/4300L, Food Chemistry

#### Materials Science and Engineering

CHEG 5273, Corrosion Control  
 CHEG 5733, Polymer Theory and Practice  
 MEEG 4303, Materials Laboratory

#### Microelectronics

CHEG 5613, Microelectronics Fabrication and Materials  
 ELEG 4203, Semiconductor Devices  
 PHYS 3614, Modern Physics  
 MATH 3423, Advanced Applied Mathematics

#### Nuclear Power Engineering

CHEG 5273, Corrosion Control  
 MEEG 4603, Basic Nuclear Engineering  
 MEEG 4623, Radiation Protection and Shielding  
 MEEG 4633, Nuclear Power Generation  
 CHEM 5263, Nuclear Chemistry

#### Pre-medicine

BIOL 1543/1541L, Principles of Biology  
 CHEM 3813, Introduction to Biochemistry  
 MBIO 2013/2011L, General Microbiology  
 ZOOL 2213/2211L, Human Physiology  
 ZOOL 2443/2441L, Human Anatomy

#### Simulation and Optimization

CHEG 5033, Technical Administration  
 CHEG 5213, Advanced Chemical Engineering Calculations  
 INEG 3313, Engineering Statistics  
 INEG 3613, Introduction to Operations Research  
 INEG 4623, Introduction to Simulations  
 MATH 3083, Linear Algebra

SEE PAGE 264 FOR CHEMICAL ENGINEERING (CHEG) COURSES

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**CIVIL ENGINEERING (CVEG)**


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Robert P. Elliott  
 Head of the Department  
 4190 Bell Engineering Center  
 575-4954

- University Professor Emeritus LeFevre
- Professors Buffington, Dennis, Elliott, Gross, Hall, Schemmel, Selvam, Wang, Young
- Professor Emeriti Ford, Heiple, Jeffus, Knowles, Moore, Parker
- Associate Professors Gattis, Soeren
- Associate Professor Emeriti Alguire, Pleimann, Thornton
- Assistant Professors, Burian, Edwards, Hale, Heymsfield, Tooley, Warren, Williams (R.), Williams (S.)

Civil engineering is the oldest of all the engineering fields, yet it is as contemporary as the need to provide solutions to today's environmental problems and to develop advanced transportation systems. The civil engineer plans, designs, builds, and operates projects for the advancement and well being of society while coordinating and conserving human resources. Civil engineering projects range from small to monumental and include public water systems, buildings, bridges, rail and highway networks, wastewater treatment plants, solid and hazardous waste disposal facilities, airports, and soil conservation and flood diversion controls.

The civil engineering profession offers a vast array of opportunities. Civil engineers may work in private employment or with public agencies. They may work indoors in activities such as planning and design, or outdoors in areas such as construction supervision. Employment is possible anywhere in the world.

The objectives of the civil engineering program are as follows:

1. To produce graduates who are prepared for entry-level positions in foundation and earthwork design and analysis; environmental engineering; transportation planning, design, materials, and operation; and concrete and steel structural design and analysis.
2. To prepare graduates for advanced civil engineering studies. To this end, all students must take courses in geotechnical, environmental, transportation, and structural engineering. Courses are designed to present "real world" applications without sacrificing conceptual and theoretical basics. Students complete design problems in each of these areas; and, as part of the senior year, they participate in a major design project (CVEG 4994, Civil Engineering Design).

The following section contains the list of courses required for the Bachelor of Science in Civil Engineering degree and a suggested sequence. All courses are not offered every semester so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

**CIVIL ENGINEERING PROGRAM**

Freshman Year - First Semester

- 3 ENGL 1013, Composition I
- 4 MATH 2554, Calculus I
- 2 CVEG 1012, Civil Engr Fund
- 3 CHEM 1103, Univ Chemistry I
- 1 CHEM 1101L, Univ Chemistry I Lab
- 3 Humanities/social science elective
- 16 semester hours

Second Semester

- 3 ENGL 1023, Technical Composition II

- 3 PHYS 2054, University Physics I
- 1 PHYS 2050L, Univ Physics I Lab
- 3 CHEM 1123, University Chemistry II
- 1 CHEM 1121L, Univ Chemistry II Lab
- 4 MATH 2564, Calculus II
- 2 GNEG 1122, Introduction CAD
- 17 semester hours

Sophomore Year - First Semester

- 4 MATH 2574, Calculus III
- 3 MEEG 2003, Statics
- 3 CVEG 1113, CE Computer Applications
- 3 Humanities/social science elective
- 3 CVEG 2053, Surveying Systems
- 1 CVEG 2051L, Surveying Systems Lab
- 17 semester hours

Second Semester

- 3 CVEG 2113, Structural Materials
- 3 INEG 3313, Engineering Statistics
- 4 MATH 3404, Differential Equations
- 3 MEEG 2013, Dynamics
- 3 MEEG 3013, Mechanics of Materials
- 16 semester hours

Junior Year - First Semester

- 4 CVEG 3304, Structural Analysis
- 3 CVEG 3133, Soil Mechanics
- 3 CVEG 3213, Hydraulics
- 3 CVEG 3413, Transportation Engineering
- 2 GEOL 3002, Geology for Engineers
- 3 Humanities/social science elective
- 18 semester hours

Second Semester

- 2 CVEG 3022, Public Works Economics
- 3 CVEG 3223, Hydrology
- 3 CVEG 3243, Environmental Engineering
- 3 CVEG 4313, Structural Steel Design I
- 4 Science Elective
- 3 Humanities/social science elective
- 18 semester hours

Senior Year - First Semester

- 3 CVEG 4143, Foundation Engineering
- 3 CVEG 4243, Environmental Engr Design
- 3 CVEG 4303, Reinforced Concrete Design I
- 3 CVEG 4433, Transportation Pavements & Materials
- 3 Civil Engineering elective
- 3 Humanities/social science elective
- 18 semester hours

Second Semester

- 3 CVEG 4513, Construction Mgmt
- 4 CVEG 4994, Civil Engineering Design
- 6 Civil Engineering electives
- 3 Humanities/social science elective
- 16 semester hours

**136 Total hours required**

**Civil Engineering Electives**

Students must select a nine-hour technical elective program in conference with their adviser. Selection should be made from 4000-level



civil engineering courses. Only in unusual circumstances will a senior student choose from the 5000 (graduate-level) courses series. Humanities and social science electives are selected from courses approved by the college. The science elective requirement is satisfied by completing one of the following course sequences: CHEM 3603 and 3601L, Organic Chemistry, GEOL 3513 and 3511L, Structural Geology, MBIO 2013 and 2011L, General Microbiology, or PHYS 2074 and 2070L, University Physics II. Lists of approved electives are on file in the department office.

SEE PAGE 275 FOR CIVIL ENGINEERING (CVEG) COURSES

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## COMPUTER SCIENCE AND COMPUTER ENGINEERING (CSCE)

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Aicha Elshabini  
Interim Head of the Department  
311 Engineering Hall  
575-6197

- Professors Brewer, Crisp, Elshabini, Lala, Skeith, Starling
- Associate Professors Apon, Beavers Deaton, Li, Lusth, Panda
- Assistant Professors Hexmoor, Parkerson, Simonson, Thompson
- Instructors Baker, Holmes, Johnson, McPherson, Wiggins

The department offers the bachelor of science degree in computer engineering, bachelor of science and bachelor of arts degrees in computer science, and master of science and doctor of philosophy degrees in both computer engineering and computer science. The undergraduate computer science degrees are described in the listing for this department in the Fulbright College of Arts and Sciences section of this catalog. The graduate degrees are described in the Graduate School Catalog.

The educational objectives of the department are to produce graduates who are recruited in a competitive market and make valuable contributions to a wide variety of industries, particularly in computer and information technology, succeed in graduate or professional studies in such areas as engineering, science, law, medicine, or business, if pursued; pursue life-long learning and continued professional development; undertake leadership roles in their profession, in their communities, and in the global society.

To meet these objectives, the computer engineering curriculum has required sequences of courses in both hardware and software aspects of computer applications. The computer engineer must understand both hardware and software techniques to design, build, and test complex digital systems. At the advanced level, students are exposed to hands-on experience with open-ended problems with opportunities for research and design.

The computer engineering program is divided into three phases. In the first year, all computer engineering undergraduate students must successfully complete a pre-professional curriculum that covers the essential foundations in mathematics, science and introductory computer engineering and programming. Due to the critical importance of this foundation material, satisfactory completion of the pre-professional curriculum is required prior to admission to sophomore level and above computer engineering courses. In the second and third years, students perform course and laboratory work in the core subjects of data structures, algorithms, digital systems, and computer organization. The final phase is a combination of technical electives and advanced courses which can be chosen from the areas of computer architecture, software engineering, networking, telecommunications, artificial intelligence, robotics, object-oriented programming, client-server programming, VLSI design, and programmable logic. Technical electives must include a mix of hardware and software courses as specified in the undergraduate handbook.

Humanities and social science electives are selected from courses approved by the College. A list of these electives is available on the Engineering College Web page or in the Dean's office. The Undergraduate Handbook has a list of approved basic science, mathematics, and technical electives. Any course not included in these lists requires faculty approval.

The following section contains the list of courses required for the Bachelor of Science in Computer Engineering degree and a suggested sequence. All courses are not offered every semester, so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

### COMPUTER ENGINEERING PROGRAM

Freshman Year - First Semester

- 4 MATH 2554, Calculus I
- 3 CHEM 1103, General Chemistry
- 1 CHEM 1101L, General Chemistry Lab
- 3 CENG 1113, Intro to Computers
- 1 CENG 1111L, Intro to Computers Lab
- 3 ENGL 1013, English Composition
- 15 semester hours

Second Semester

- 4 MATH 2564, Calculus II
- 3 PHYS 2054, University Physics I
- 1 PHYS 2050L, University Physics I Lab
- 3 CENG 1123, Intro Programming
- 1 CENG 1121L, Intro Programming Lab
- 3 ENGL 1023, Technical Composition
- 3 MATH 2103, Discrete Math
- 18 semester hours

Sophomore Year - First Semester

- 4 MATH 2574, Calculus III
- 3 PHYS 2074, University Physics II
- 1 PHYS 2070L, University Physics II Lab
- 3 CENG 2113, Digital Tech I
- 3 CENG 2143, Data Structures
- 3 Humanities/social science elective
- 17 semester hours

Second Semester

- 4 MATH 3404, Differential Equations
- 3 ELEG 3903, Electronics and Circuits
- 3 CENG 2133, Assembly Language
- 3 CENG 2123, Digital Tech II
- 3 Basic science elective
- 16 semester hours

Junior Year - First Semester

- 3 CENG 3953, Logic Synthesis-VHDL
- 3 Technical Elective
- 3 CENG 3313, Algorithms
- 3 History/Government Requirement
- 3 Humanities/social science elective
- 15 semester hours

Second Semester

- 3 Free Elective
- 3 PHIL 3103, Ethics and the Professions
- 3 Technical Elective
- 3 CENG 3213, Computer Organization
- 3 STAT 3013, Introduction to Probability and Statistics  
(INEG 3313 may be substituted)
- 15 semester hours

**Senior Year - First Semester**

3 CENG 4513, Software Engineering  
 1 CENG 4571, Senior Design Project  
 3 CENG 4213, Computer Architecture  
 6 Technical electives  
 3 Humanities/social science elective  
 16 semester hours

**Second Semester**

3 CENG 457, Senior Design Project  
 3 CENG 4413, Operating Systems  
 6 Technical electives  
 3 Humanities/social science. elective (3000+)  
 15 semester hours

**127 Total hours required****Degree Program Changes**

Students must meet all requirements of their degree programs and are expected to keep informed concerning current regulations, policies, and program requirements in their fields of study. Changes made in curriculum at a level beyond that at which a student is enrolled might become graduation requirements for that student. Changes made in the curriculum at a level lower than the one at which a student is enrolled are not required of that student. Students should consult their departmental adviser for additional information.

**Requirements for Departmental Honors in Computer Engineering:**

The Departmental Honors Program in Computer Engineering is designed for the superior student and is intended to help the student develop a more comprehensive view of the nature of Computer Engineering. The program provides a vehicle for the recognition of achievements of work beyond the usual course of study. Higher degree distinctions are recommended only in truly exceptional cases and are based upon the candidate's whole program of honors studies.

The department considers the following requirements necessary for graduation with honors:

1. The candidate must satisfy the requirements set forth by the College of Engineering.
2. A student must obtain at least a 3.50 grade-point average in required Computer Engineering and Computer Science courses.
3. The student must complete 7 hours of Honors credit in the major, which includes 4 hours of Honors Thesis taken as two successive semesters of CSCE 4912H and 3 hours of non-thesis.

SEE PAGE 263 FOR COMPUTER ENGINEERING (CENG) COURSES.  
 CORE COURSES ARE LISTED ON PAGE 125 UNDER COMPUTER SCIENCE AND COMPUTER ENGINEERING (CSCE).

**ELECTRICAL ENGINEERING (ELEG)**

Aicha Elshabini  
 Head of the Department  
 3217 Bell Engineering Center  
 575-3009

- Distinguished Professor Yeagan
- University Professors Brown (W.D.), Schmitt,
- Professors Ang, Balda, Elshabini, Jones, Mantooh, Martin, Naseem, Schaper, Waite
- Associate Professors Brown (R.L.), Caldwell, Gattis,
- Assistant Professors Barlow, El-Shenawee, Lee

Electrical engineering is a profession in charge of designing electrical devices and assemblies to benefit mankind. This may encompass systems such as satellite antennas, microelectronics, portable or wireless electronics, or embedded computers in everyday consumer electronics.

The electrical engineering graduate is at the forefront of the technology leading to the dramatic increase in global communications, the accelerated use of electric power, the dominating influence of the computer on modern society, and a host of other developments. The increased use of electronic equipment for measurement and control has spread into such diverse areas as improved health care, transportation, recreation, agricultural production, marketing, manufacturing, and countless others. This wide-spread and expanding use of electronic equipment in virtually all fields has made electrical engineering the largest of all scientific disciplines and assures a continuing demand for electrical engineering graduates throughout business and government.

The University of Arkansas is the state land-grant university and is a nationally competitive, student-centered, research university serving Arkansas and the world. As such, our mission is education, research, and service. The electrical engineering program is designed to offer a high-quality course of instruction involving classroom, laboratory, and extracurricular activities that results in graduates qualified and prepared to meet the demands of a professional career in the present and future work place and able to assume a responsible place of leadership in a complex technological society.

The educational mission of the department is conducted through both the undergraduate and graduate programs. The educational objectives for the undergraduate program, which leads to a Bachelor of Science degree in electrical engineering, are to produce graduates that exhibit the following attributes:

1. are recruited in a competitive market and valued as reliable and competent employees by a wide variety of industries, in particular electrical engineering industries,
2. succeed in graduate studies, such as engineering, science, law, medicine, business, and other professions, if pursued,
3. understand the need for life-long learning and continued professional development for a successful and rewarding career, and
4. accept responsibility for leadership roles, in their profession, in their communities, and in the global society.

The graduate program offers a Master of Science degree in Electrical Engineering and a Doctor of Philosophy degree in Engineering. Having received additional instruction and hands-on experience beyond the undergraduate level, an additional educational objective for the graduate program is to produce graduates that are prepared to promptly address critical issues and assume advanced positions in the profession, such as management, design, and development.

The research mission of the department is conducted mainly through the graduate program. Internal and external funded research projects serve to

1. discover new knowledge, address technical problems, and develop new electrical/electronic technologies,
2. provide the tools and resources which keep our faculty at the cutting edge of electrical engineering,
3. provide financial support for graduate students, and
4. improve the quality of life for citizens of Arkansas and the world.

The graduate program also supports the undergraduate program by giving top undergraduate students access to research laboratories with state-of-the-art equipment and software. Topics covered in graduate courses migrate into senior undergraduate elective courses and eventually into required undergraduate courses.

Faculty, students, administrators, and staff conduct the service mission of the department. The electrical engineering program, including

faculty, students, staff, and facilities, is a major resource of the state, region and nation. Faculty members are encouraged to provide services to both the community and the profession. Faculty members are active in local, state, national, and international professional and service organizations, as well as public and private schools involving grades K-12.

The electrical engineering curriculum is designed to provide students with a knowledge of scientific principles and methods of engineering analysis to form a solid foundation for a career in design, research and development, or management. Students progressively build their design experience throughout the curriculum and demonstrate this ability in the senior design lab. Equally important, the curriculum introduces students to subjects in the humanities, social sciences, and ethics so they may better understand the interaction of technology and society.

The electrical engineering curriculum is divided into three phases. The first year is the pre-professional curriculum, which concentrates on development of a sound understanding of basic science and mathematics. Due to the crucial importance of this foundation material to the study of electrical engineering, satisfactory completion of the pre-professional curriculum is required prior to admission to entry-level electrical engineering courses. The second- and third-year course work further develops scientific principles and covers the basic core of the professional curriculum in electrical engineering. The fourth year is composed primarily of senior-level elective courses. At this time, the student in conjunction with his or her adviser may plan a program to concentrate in one or more of the technical specializations within electrical engineering. This final year permits the student to tailor a program suited to his or her individual career objectives.

The graduation requirement in electrical engineering is 128 semester hours. The following section contains the list of courses required for the Bachelor of Science in Electrical Engineering degree and a suggested sequence. All courses are not offered every semester so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

### ELECTRICAL ENGINEERING PROGRAM

#### Freshman Year - First Semester (Pre-Professional Curriculum)

- 1 ELEG 1001, Intro to Electrical Engineering
- 3 ENGL 1013, Composition I
- 4 MATH 2554, Calculus I
- 4 PHYS 2054, University Physics I
- 3 History/Government Requirement
- 15 semester hours

#### Second Semester

- 1 ELEG 1011, Engineering Success and Ethics
- 3 ENGL 1023, Technical Composition II
- 4 MATH 2564, Calculus II
- 3 CHEM 1123, University Chemistry II
- 1 CHEM 1121L, Univ Chemistry II Lab
- 4 PHYS 2074, University Physics II
- 16 semester hours

#### Sophomore Year - First Semester (Professional Curriculum)

- 3 CENG 1113, Intro to Computers
- 1 CENG 1111L, Intro to Computers Lab
- 3 ELEG 2103, Electric Circuits I
- 1 ELEG 2101L, Electric Circuits I Lab
- 3 ELEG 2903, Digital Systems
- 4 MATH 2574, Calculus III
- 3 Humanities-Social Science Elective
- 18 semester hours

#### Second Semester

- 3 CENG 1123, Introduction to Programming
- 1 CENG 1121L, Introduction to Programming Lab
- 3 ELEG 2113, Electric Circuits II
- 1 ELEG 2111L, Electric Circuits II Lab
- 3 ELEG 2913, Digital Design II
- 4 MATH 3404, Differential Equations
- 15 semester hours

#### Junior Year - First Semester

- 3 ELEG 3123, Analog Signal Processing
- 1 ELEG 3121L, Analog Signal Proc Lab
- 3 ELEG 3213, Electronics I
- 1 ELEG 3211L, Electronics I Lab
- 3 ELEG 3703, Electromagnetics I
- 3 ELEG 3923, Microprocessor System Design
- 3 MEEG 2023, Introductory Mechanics
- 0 ENGL 2003, Advanced Composition
- 17 semester hours

#### Second Semester

- 3 ELEG 3133, Digital Signal Processing
- 1 ELEG 3131L, Digital Signal Proc Lab
- 3 ELEG 3223, Electronics II
- 1 ELEG 3221L, Electronics II Lab
- 3 ELEG 3303, Electromechanical Energy Conversion
- 1 ELEG 3301L, Electromechanical Energy Conversion Lab
- 3 ELEG 3143, Stochastic Signal Processing
- 3 Humanities Social Science Elective
- 18 semester hours

#### Senior Year - First Semester

- 1 Electrical Eng Design I
- 3 Electrical Eng Technical Elective
- 3 Technical Elective8
- 3 Math/Science Elective
- 3 Humanities-Social Science Elective
- 3 Upper-level Humanities/Social Science Elective
- 16 semester hours

#### Second Semester

- 1 Electrical Eng. Design II
- 6 Electrical Eng Technical Elective
- 3 Technical Elective
- 3 Upper-level Humanities-Social Science Elective
- 13 semester hours

### 128 Total hours required

### Degree Program Changes

A student must meet all requirements of the degree programs and is expected to keep in-formed concerning current regulations, policies, and program requirements in a chosen field of study. Changes made in curriculum at a level beyond that at which a student is enrolled may become graduation requirements for that student. Changes made in the curriculum at a level lower than the one at which a student is enrolled are not normally required for that student. Students should consult their adviser for additional information.

### Recommended Technical Studies

Students in electrical engineering are required to complete 15 semester hours of technical electives. A minimum of nine semester hours of these courses must be 4000- or 5000-level electrical engineering elective courses. A student may select the remaining six semester hours from upper-division technical courses in electrical engineering, mathe-

matics, engineering, and the sciences with the approval of an adviser. Not more than six semester hours total in ELEG 488V and ELEG 489V may be credited toward technical electives.

### Communications

ELEG 4603, Deterministic DSP System Design  
 ELEG 4623, Communication Systems  
 ELEG 4683, Intro to Image Processing  
 ELEG 4713, Electromagnetic Transmission  
 ELEG 5173L, Digital Signal Proc Lab  
 ELEG 5183L, DSP Digital Communications Lab  
 ELEG 5193L, Advanced DSP Proc Lab  
 ELEG 5403, Systems Theory  
 ELEG 5613, Introduction to Telecommunications  
 ELEG 5623, Information Theory  
 ELEG 5633, Detection and Estimation  
 ELEG 5643, Computer Comm Networks  
 ELEG 5653, Artificial Neural Networks  
 ELEG 5673, Pattern Recognition  
 ELEG 5683, Image Processing  
 ELEG 5713, Antennas and Radiation Computers  
 ELEG 4683, Intro to Image Processing  
 ELEG 4933, Minicomputer Applications  
 ELEG 4943, Digital Systems Design  
 ELEG 4983, Intro to Computer Architecture  
 ELEG 5153, Real Time Data Acquisition Systems  
 ELEG 5163, Advance Microcontroller Design Project  
 ELEG 5173L, Digital Signal Proc Lab  
 ELEG 5643, Computer Comm Networks  
 ELEG 5653, Artificial Neural Networks  
 ELEG 5683, Image Processing  
 ELEG 5913, Parallel Programming  
 ELEG 5963, Computer Systems Optimization  
 CENG 2143, Data Structures Applications  
 CENG 4813, Computer Graphics  
 CENG 3943, Engineering Applications of Unix  
 CENG 4423, Computer Systems Analysis

### Controls

ELEG 4403, Control Systems  
 ELEG 4463L, Control Systems Lab  
 ELEG 4603, Deterministic DSP System Design  
 ELEG 5173L, Digital Signal Proc Lab  
 ELEG 5413, Stochastic Control Systems  
 ELEG 5423, Optimal Control Systems  
 ELEG 5453, Adaptive Filtering and Control  
 ELEG 5653, Artificial Neural Networks

### Digital Systems

ELEG 4603, Deterministic DSP System Design  
 ELEG 4943, Digital Systems Design  
 ELEG 4963, Field Programmable Gate Array Lab  
 ELEG 5113, Stochastic DSP Systems Design  
 ELEG 5163, Advanced Microcontroller Design  
 ELEG 5173L, Digital Signal Proc Lab  
 ELEG 5183L, Digital Comm Lab  
 ELEG 5193L, Advanced DSP Proc Lab  
 ELEG 5653, Artificial Neural Networks  
 ELEG 5673, Pattern Recognition  
 ELEG 5683, Image Processing

### Energy Systems

(Power Distribution, Electric Machines,  
 Power Electronics, Electric Propulsion)

ELEG 4323, Switch Mode Power Conversion  
 ELEG 4403, Control Systems  
 ELEG 4463L, Control Systems Lab  
 ELEG 4503, Elec Power Dist Systems  
 ELEG 4513, Power System Analysis  
 ELEG 4523, Intro to Power Electronics  
 ELEG 4533, EMC in Power Electronics  
 ELEG 5313, Power Semiconductor Devices  
 ELEG 5513, Electric Power Quality  
 ELEG 5533, Power Electronics and Motor Drives  
 ELEG 5543, Communication Networks for Motion Control  
 MEEG 4603, Basic Nuclear Engineering

### Microelectronics

(Devices, Modeling, Fabrication, Design, Test)

ELEG 4203, Semiconductor Devices  
 ELEG 4223, Design and Fabrication of Solar Cells  
 ELEG 4233, Intro to Integrated Circuit Design  
 ELEG 4243, Analog Integrated Circuits  
 ELEG 4273, Electronics Manufacturing Processes  
 ELEG 4283, Mixed Signal Test Eng I  
 ELEG 4293, Mixed-Signal Modeling and Simulation  
 ELEG 4323, Switch Mode Power Conversion  
 ELEG 5213, Integrated Circuit Fabrication Technology  
 ELEG 5233, Solid State Electronics I  
 ELEG 5253L, Integrated Circuit Design Lab I  
 ELEG 5263L, Integrated Circuit Design Lab II  
 ELEG 5273, Electronic Packaging  
 ELEG 5283, Mixed Signal Test Eng II  
 ELEG 5293L, Integrated Circuits Fabrication Lab  
 ELEG 5313, Power Semiconductor Devices

The following courses are applicable to all of the technical specialization areas listed above.

INEG 3113, Law and Ethics  
 INEG 3213, Safety Engineering  
 INEG 3413, Eng Economic Analysis  
 INEG 4223, Occupational Safety and Health Standards  
 INEG 4433, Administrative Analysis  
 INEG 4443, Engineering Management

### Mathematics/Science Elective

Each student in electrical engineering is required to complete three semester hours of mathematics or science elective to be chosen from the following courses with the approval of the student's advisor.

MATH 3083, Linear Algebra  
 MATH 3353, Numerical Methods in Analysis  
 MATH 3423, Advanced Applied Mathematics  
 MATH 3443, Complex Variables for Application  
 STAT 3013 Intro to Probability and Statistics  
 CHEM 3504, Physical Chemistry I  
 CHEM 3603, Organic Chemistry I  
 PHYS 3113, Analytical Mechanics  
 PHYS 3544, Optics  
 PHYS 2094, University Physics III  
 ZOO 2213, Human Physiology  
 MEEG 3703, Numerical Methods I

SEE PAGE 280 FOR ELECTRICAL ENGINEERING (ELEG) COURSES



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**INDUSTRIAL ENGINEERING (INEG)**


---

John English

Head of the Department

4207 Bell Engineering Center

575-3156

- Distinguished Professor White
- Professors Asfahl, English, Johnson
- Associate Professors Fant, Rossetti
- Assistant Professors Cassady, Collins, Mason, Nachtmann,
- Adjunct Associate Professor Gattis
- Adjunct Assistant Professor Chimka
- Instructor Harrelson, Watson

The mission of the industrial engineering department at the University of Arkansas is to be a nationally competitive, student-centered, industrial engineering program serving Arkansas and the world through undergraduate and graduate studies, and leading-edge research programs.

Industrial engineers are concerned with improving organized activity. The physical arrangement of people, equipment and material significantly influences the effectiveness of any organization — whether the organization is industrial, governmental, or commercial.

Today's industrial engineers develop applications of new processing automation and control technology; install data processing systems, performance measures and standards, job evaluation and wage and salary programs; research new products and product applications; devise ways to improve productivity through application of technology and human factors; select operating processes and methods to accomplish a given task using proper tools and equipment; design facilities, management systems, operations procedures, storage systems; improve allocation of resources, planning and control systems for distribution of goods and services, production, inventory, quality and plant maintenance; enhance plant environment and the quality of working life; evaluate reliability and quality performance; implement office systems, procedures, and policies; analyze complex business problems through operations research; conduct long-range organization studies, plant location surveys, system effectiveness studies; and study potential markets for goods and services, raw material sources, labor supply, energy resources, financing and taxes.

Industrial engineers integrate engineering skills with mathematics and computer science tools, providing systematic ways to maximize productivity and quality while minimizing time and cost.

The goal of the Industrial Engineering Undergraduate Program at the University of Arkansas is to prepare men and women for professional careers and graduate studies in Industrial Engineering. We provide a foundation in mathematics, science, humanities and social sciences, engineering science, and engineering design to produce Industrial Engineers with the intellectual, technical, and professional competence to develop, implement, and manage industrial engineering solutions to complex problems in industry, government, and society.

The IE Program Objectives represent and describe the expected accomplishments of our graduates resulting from participation within our program within the first few years after graduation. Our objectives have been developed to address the needs of our constituencies and to be consistent with and supportive of our mission and programmatic goals. The IE Program Objectives are as follows:

1. To train and educate students in the mathematics, science, methodologies, computational skills, and analysis techniques of Industrial Engineering practice including such core Industrial Engineering topics as probability, statistics, engineering economics, human factors, engineering management, computing, and operations research applied to manufacturing, logis-

tics, and service systems.

2. To develop students with written and oral communication skills, team work skills, professionalism, and ethics so that they can contribute to Industrial Engineering practice and leadership within the profession.
3. To develop students who possess the ability to design, improve, and manage integrated systems of people, technologies, material, information, and equipment within the context of societal and contemporary issues in engineering practice such as safety and health.
4. To develop students who possess the ability to solve unstructured problems by collecting, modeling, analyzing, and interpreting data within Industrial Engineering practice.
5. To make students aware of the need for and to provide the ability to accomplish life-long learning, continuing education, and professional growth within the field of Industrial Engineering.

These specific objectives are reinforced by a senior capstone design course in which the student must apply the skills to a comprehensive design problem for an industry setting. This course integrates preceding courses through development of physical systems and organizational characteristics, financial aspects, product analysis, equipment selection, production layout, distribution systems, and overall economic analysis.

The following section contains the list of courses required for the Bachelor of Science in Industrial Engineering degree and a suggested sequence. All courses are not offered every semester so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites.

The total graduation requirement in industrial engineering is 130 hours. For further information please visit us on the World Wide Web at <http://web.ineg.uark.edu>.

**INDUSTRIAL ENGINEERING PROGRAM**

Freshman Year - First Semester

- 3 INEG 1103, Principles of Indust Engr
- 4 MATH 2554, Calculus I
- 3 ENGL 1013, Composition I
- 3 CHEM 1103, University Chemistry I
- 1 CHEM 1101L, Univ Chemistry I Lab
- 14 semester hours

Second Semester

- 4 MATH 2564, Calculus II
- 3 INEG 1403, Industrial Cost Analysis
- 3 ENGL 1023, Technical Composition II
- 3 Science Elective
- 2 GNEG 1122, Introduction CAD
- 15 semester hours

Sophomore Year - First Semester

- 4 MATH 2574, Calculus III
- 3 Computer Elective I
- 3 INEG 3413, Eng Economic Analysis
- 4 PHYS 2054, University Physics I
- 3 ECON 2143, Basic Economics  
(humanities/social science elective)
- 17 semester hours

Second Semester

- 4 MATH 3404, Differential Equations
- 3 Computer Elective II
- 3 INEG 3513, Manuf System Design
- 3 INEG 3313, Engineering Statistics
- 4 PHYS 2074, University Physics II
- 17 semester hours

**Junior Year - First Semester**

3 INEG 3713, Methods and Standards  
 3 Engineering Science Elective I  
 3 INEG 4333, Industrial Statistics  
 3 ELEG 3903, Electric Circuits and Machines  
 6 Humanities/social science elective  
 (History or government requirement:  
 HIST 2003, HIST 2013, or PLSC 2003)  
 18 semester hours

**Second Semester**

3 INEG 3613, Intro to Operations Research  
 3 Engineering Science Elective II  
 3 INEG 4523, Automated Production  
 3 Engineering Science Elective III  
 3 Humanities/social science electives  
 15 semester hours

**Senior Year - First Semester**

3 INEG 4433, Administrative Analysis  
 (An upper-level ROTC course may be substituted.)  
 3 INEG 4543, Materials Handling  
 3 INEG 4623, Intro to Simulation  
 3 Technical elective  
 3 INEG 4723, Ergonomics  
 3 Humanities/social science electives  
 18 semester hours

**Second Semester**

3 INEG 4553, Production Planning/ Control  
 4 INEG 4904, I.E. Design  
 3 Humanities/social science elective  
 6 Technical electives  
 16 semester hours

**130 Total hours required****Technical Electives**

The purpose of technical electives is to provide students with the opportunity to expand their education along lines of particular interest to them. The approved list of technical electives is available in the industrial engineering department. At least three hours must be selected from INEG courses.

**Humanities/Social Science Electives**

Although any elective included on the humanities/social science list may be selected, General Psychology PSYC 2003 is recommended for industrial engineers.

**Science Elective**

The approved list of science electives is available in the industrial engineering departmental office.

**Computer Elective**

The approved list of computer electives is available in the industrial engineering departmental office.

**Engineering Science Electives**

The approved list of engineering science electives is available in the industrial engineering departmental office.

SEE PAGE 299 FOR INDUSTRIAL ENGINEERING (INEG) COURSES

**MECHANICAL ENGINEERING (MEEG)**

William F. Schmidt

Head of the Department

204 Mechanical Engineering Bldg.

575-3153

- Professors Bhat, Cole, Jong, Schmidt, West
- Associate Professors Couvillion, Gordon, Malshe, Nutter, Roe, Springer
- Assistant Professor, Tung
- Instructor Davis

The mechanical engineering program is designed to offer a high-quality course of instruction involving classroom, laboratory, and extra-curricular activities that results in graduates qualified and prepared to meet the demands of a professional career in the present and future work place, and able to assume a responsible place of leadership in a complex technological society.

The courses offered in mechanical engineering provide the student with a broad understanding of fundamental scientific principles that serve as a background for many fields of specialization. The undergraduate curriculum is designed to stress basic engineering principles and to assist in developing creative thinking. Emphasis is placed on the science and art of designing machines and systems, of converting energy into useful forms, and developing a basic understanding of engineering mechanics. The undergraduate program leads to a Bachelor of Science degree in Mechanical Engineering; its educational objectives are to produce graduates who

1. effectively analyze and design mechanical systems and energy systems
2. contribute to the success of companies in Arkansas and the rest of the world through the practice of mechanical engineering
3. meet or exceed the needs and expectations of mechanical engineering employers in industry, government, and private practice
4. engage in professional activities that promote the mechanical engineering profession and provide continuing self-development
5. succeed in graduate study and research if pursued

The Bachelor of Science in Mechanical Engineering curriculum includes, in addition to the humanities/social science elective courses, a total of 12 hours of technical and science electives. A student must select these electives with the approval of his or her advisor. It is expected that electives will be chosen to provide a coherent program within one or more areas of specialization or options available to mechanical engineers. Areas of specialization are available in the nuclear, mechanical systems design, materials, thermal systems design, and engineering mechanics fields. Current options include pre-medical, management, business, and astronautics.

The first-year curriculum is essentially the same as prescribed for all engineering freshmen. The full curriculum follows, with the number of credit hours at the left, preceding course numbers and titles. In addition to the curriculum below, all students must meet the exemption requirements or take ENGL 2003 Advanced Composition.

The following section contains the list of courses required for the Bachelor of Science in Mechanical Engineering degree and a suggested sequence. All courses are not offered every semester so students who deviate from the suggested sequence must pay careful attention to course scheduling and course prerequisites. Students interested in obtaining a sequencing schedule of courses may contact the Mechanical Engineering office.

**MECHANICAL ENGINEERING PROGRAM**

## Freshman Year - First Semester

3 ENGL 1013, Composition I  
 3 CHEM 1103, University Chemistry I  
 1 CHEM 1101L, University Chemistry I Lab  
 4 MATH 2554, Calculus I  
 2 GNEG 1122, Introduction CAD  
 3 MEEG 1103, Introduction to Mechanical Engineering  
 16 semester hours

## Second Semester

3 CHEM 1123, University Chemistry II  
 1 CHEM 1121L, University Chemistry II Lab  
 4 MATH 2564, Calculus II  
 4 PHYS 2054, University Physics I  
 0 PHYS 2050L, University Physics I Lab  
 3 ENGL 1023, Technical Composition II  
 15 semester hours

## Sophomore Year - First Semester

4 PHYS 2074, Univ Physics II  
 0 PHYS 2070L, Univ Physics II Lab  
 4 MATH 2574, Calculus III  
 3 MEEG 2303, Introduction to Materials  
 3 MEEG 2003, Statics  
 14 semester hours

## Second Semester

4 MATH 3404, Differential Equations  
 3 MEEG 2013, Dynamics  
 3 MEEG 2403, Thermodynamics  
 3 MEEG 3703, Numerical Methods  
 3 ELEG 3903, Electric Circuits and Machines  
 16 semester hours

## Junior Year - First Semester

3 MEEG 3013, Mechanics of Materials  
 3 MEEG 3113, Machine Dynamics & Control  
 2 MEEG 3202, Mechanical Engr Lab I  
 3 MEEG 3503, Mechanics of Fluids  
 3 ELEG 3913, Engineering Electronics  
 3 Humanities/social science elective  
 (History or Gov. Requirement)  
 17 semester hours

## Second Semester

2 MEEG 3212, Mechanical Engr Lab II  
 3 MEEG 4413, Heat Transfer  
 3 Technical/Science elective  
 3 ECON 2143 or ECON 2013  
 3 Humanities/social science elective (lower-level)  
 14 semester hours

## Senior Year - First Semester

2 MEEG 4132, Creative Project I  
 1 MEEG 491V, Special Project  
 3 MEEG 4103, Machine Element Design  
 2 MEEG 4202, Mechanical Engr Lab III  
 3 MEEG 4483, Thermal Systems Analysis & Design  
 3 Technical/science elective  
 3 Humanities/social science elective (3000 - 4000 level)  
 17 semester hours

## Second Semester

3 MEEG 4133, Creative Project Design II  
 3 Technical/science elective  
 3 Technical/science elective  
 3 Humanities/social science elective (lower level)  
 3 Humanities/social science elective (3000- 4000-level)  
 15 semester hours

**124 Total hours required****Technical/Science Electives**

The purpose of technical/science electives is to provide students with the opportunity to expand their education along lines of particular interest to them. The approved list of technical/science electives and selected courses for various options is available in the Mechanical Engineering department office.

**Humanities/Social Science Electives**

Any elective included on the humanities/social science list may be selected. This list is available in the department office.

SEE PAGE 309 FOR MECHANICAL ENGINEERING (MEEG) COURSES

**OPERATIONS MANAGEMENT (OMGT)**

Offered through Graduate Resident Centers

Terry R. Collins  
 Chair of Studies  
 4207 Bell Engineering Center  
 (479) 575-7426  
 Web: <www.opnsmgmt.uark.edu>  
 E-Mail: ncsloan@enr.uark.edu

- Professors Asfahl, English
- Associate Professor, Gattis
- Assistant Professors Collins, Nachtmann
- Visiting Assistant Professors Benamon, Berthelot, Carmichael, Caviness, Collier, Dansby, Day, Donaldson, Donatelli, Ellixson, Findley, Garner, George, Hurd, Lamphear, Maksi, Martin, McCaa, Miller, Moores, Moorhead, Nethercutt, Noland, O'Neal, Rasmussen, Soler, Ton, Wilke, Worms, Yeager, Zilinsky

**Degree Conferred: M.S. (OMGT)**

The Master of Science program in operations management is directed toward the acquisition of practical knowledge in the areas of project planning, quality assurance, safety management, inventory techniques, and human factors analysis.

The operations management program is offered at Graduate Resident Centers in Arkansas, Tennessee, and Florida. Courses are offered in eight-week terms, five terms an academic year.

The operations management curriculum is aimed at the needs of both military and civilian working managers of technical and logistics operations, regardless of the major they selected as an undergraduate student. The subject matter is patterned after the industrial engineering curriculum, but is less technical and does not require a calculus mathematics background.

Before students complete more than 12 hours of course work toward the operations management degree, they must successfully complete the following courses (or equivalent courses or demonstrate knowledge of subject areas):

- OMGT 4313, Law and Ethics
- OMGT 4323, Industrial Cost Analysis

OMGT 4333, Applied Statistics

OMGT 4853, Data Processing Systems

These courses are offered at the undergraduate level and may not be applied toward the requirements for a Master of Science degree. To fulfill requirements for the M.S. degree, a student must earn a total of 30 semester hours credit in the program.

SEE PAGE 317 FOR OPERATIONS MANAGEMENT (OMGT) COURSES

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### OPERATIONS RESEARCH (ORES)

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John R. English

Department Head of Industrial Engineering

4207 Bell Engineering Center

(479) 575-3156

E-Mail: [jre@uark.edu](mailto:jre@uark.edu)

Scott J. Mason

Graduate Studies Chairman

4207 Bell Engineering Center

(479) 575-5521

E-Mail: [mason@uark.edu](mailto:mason@uark.edu)

Web: <http://www.ineg.uark.edu>

- Distinguished Professor White
- Professors Asfahl, English, Johnson
- Associate Professors Fant, Rossetti
- Assistant Professors Cassady, Collins, Mason, Nachtmann
- Adjunct Associate Professor Gattis
- Adjunct Assistant Professor Chimka

### Degree Conferred: M.S.O.R. (ORES)

The Department of Industrial Engineering offers a graduate program leading to the Master of Science in Operations Research (M.S.O.R.) for engineering, science, and other non-engineering graduates. Candidates

for the degree must possess or obtain mathematical training through multivariate calculus, knowledge of probability theory and statistics, and either linear algebra or undergraduate operations research. Minors in the areas of mathematics, computer science, and statistics are also available under the program.

In addition to the requirements of the Graduate School and the College of Engineering, the following program requirements must be satisfied. A number of undergraduate prerequisites exist that are specified in the Department's Handbook for Advanced Degrees.

1. All candidates for the Master of Science in Operations Research degree (M.S.O.R.) must successfully complete three core courses: INEG 5313 Probability Theory and Stochastic Processes, INEG 5613 Optimization Theory I, and INEG 5823 Systems Simulation.
2. Candidates for a Master of Science in Operations Research degree (M.S.O.R.) who present a thesis are required to complete a minimum of 24 semester hours of course work and six semester hours of thesis.
3. Candidates for the degree who present a project are required to complete 30 semester hours of course work and three hours credit for INEG 513V, Master's Research Project and Report.
4. Candidates for the degree who do not present either a thesis or project are required to complete 36 semester hours of course work.
5. All candidates must successfully complete a master's oral examination that is conducted by the candidate's faculty committee.
6. Attendance at INEG graduate seminar is required of all graduate students in industrial engineering.

COURSE LISTINGS AND DESCRIPTIONS MAY BE FOUND UNDER INDUSTRIAL ENGINEERING.





# The School of Law

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## University of Arkansas School of Law

107 Leflar Law Center  
Waterman Hall

### Dean of the School

107 Leflar Law Center  
575-4504  
E-Mail: ratkins@uark.edu

### Law School Admissions

575-3102  
E-Mail: jkmiller@uark.edu

### National Center for Agricultural Law Research and Information

575-7640  
Web Site: <http://www.NationalAgLawCenter.org>

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### Dean

Richard B. Atkinson, A.B., M.Div., J.D.  
Duke University and Yale University

### Associate Dean for Academic Affairs

Carol R. Goforth, B.A., J.D.  
University of Arkansas

### Associate Dean for Students

James K. Miller, B.S.B.A., J.D.  
University of Arkansas

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### World Wide Web

<http://law.uark.edu>

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## LAW FACULTY

- Distinguished Professors Gitelman, Killenbeck, Laurence
- Professors Atkinson, Beard, Brill, Brummer, Flaccus, Goforth, Guzman, Judges, Leflar, Matthews, Moberly, Mullane, Norvell (P.), Richards, Watkins
- Associate Professors Bailey, Kelley, Kilpatrick, Nance, Schneider, Seligmann, Sheppard
- Clinical Associate Professors Coats, Foster, Norvell (L.), Sampson, Tarvin
- Assistant Professors Circo, Ewelukwa
- Clinical Assistant Professor Hamm

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## GOALS AND OBJECTIVES

The primary goal of the University of Arkansas School of Law is to prepare lawyers who will render high-quality professional service to their clients, who are interested in and capable of advancing legal progress and reform, and who are prepared to fill the vital role of the lawyer as a community leader.

The School of Law has certain widely shared objectives for its educational program. There are a number of important skills and qualities every lawyer should possess. The major objectives of legal study are to see that graduates possess these skills and qualities upon completion of their legal studies.

These objectives can best be realized by a competent and dedicated full-time faculty working in partnership with an interested and involved bench and bar. The faculty and administrative staff at the School strive to maintain mutually beneficial relationships with judges and practicing lawyers. Appellate courts regularly schedule cases at the School. The judges meet with students informally after the arguments.

While only full-time faculty members teach first-year courses and other required substantive law courses, practice skill courses such as legal clinic and trial advocacy and activities such as client counseling depend on the assistance of the practicing bar.

The School of Law educational program is directed to lawyers and judges as well as to law students. The study of law cannot end with the receipt of a diploma. Significant and rapidly changing developments in substantive and procedural law and in the way that law is practiced has created the need for a quality program of continuing legal education. Recognizing this need, the University of Arkansas School of Law, in cooperation with the organized bar, provides lawyers and judges with the opportunity to enhance their knowledge and skills through seminars, workshops, and publications. These programs attempt to blend practical considerations in the solution of legal problems with policy, theoretical, and ethical considerations.

The University of Arkansas School of Law also has a strong sense of responsibility to the people of Arkansas. Thus, members of the faculty

and student body are active in numerous public service activities. Legal counsel to the indigent is provided through the clinical education program at the School and by special court appointments from time to time. Students and faculty also serve on bar, civic, and legislative committees and task forces. A number of faculty and students contribute time and expertise to state agencies and law reform groups. All of these activities offer to students a laboratory of legal work that is eminently real, while at the same time enabling the University of Arkansas School of Law to be of service to the people of Arkansas.

## FACILITIES

The Robert A. Leflar Law Center facility includes two buildings, Waterman Hall and the Law Programs Center.

Waterman Hall houses the Young Law Library and includes courtroom space, classrooms, seminar rooms, student lounges, and office space for student organizations, faculty and staff. The Law Programs Center houses the legal clinic, the National Center for Agricultural Research and Information, and the *Arkansas Law Review*.

Improvements have been and continue to be made to the Leflar Law Center as the need for expansion arises. In recent years, substantial renovations have been made to the student lounges and classrooms. In addition to the cosmetic improvements, a generous gift of more than \$500,000 from alumnus Ron LeMay enabled the school to update and expand its electronic infrastructure to accommodate new technology, which includes a videoconferencing system, multi-media retrieval system, structured wiring system and data equipment.

A capital campaign is currently underway as the School of Law seeks to obtain funding for an addition to house classrooms that will readily accommodate state-of-the-art technology. If successful, the library and other student spaces will be significantly expanded.

### Robert A. and Vivian Young Law Library

The Young Law Library contains more than a quarter million volumes, including cases and statutes from every American jurisdiction. The library also contains a current and complete collection of legal encyclopedia, digests, tests, treatises, law reviews, reports of administrative agencies, and other government publications.

The Young Law Library is a depository for federal, state, and United Nations documents. It is the only U.N. documents library in the state and one of a few in the Midwest. The library includes a growing collection of agricultural law materials developed with assistance from the National Center for Agricultural Law Research and Information (NCALRI). We have also begun collecting international legal materials to support the curriculum and faculty research.

Students researching legal problems use traditional printed resources and electronic resources available across the Internet. Portals such as Loislaw.com, LEXIS, WESTLAW, the State of Arkansas Web page, the NCALRI and the Young Library's page help students identify and use appropriate resources. Two computer labs are available for student use. While primarily designed for the use of Arkansas students, the Young Law Library also serves the research needs of the bench, the bar, and the University faculty. The Young Law Library provides an attractive and comfortable atmosphere for study and research. Included within the law library is the Barrett Hamilton Law Library Mezzanine, a particularly attractive study and shelf space area. In addition, The main campus library, Mullins Library, is located near the Young Law Library. The two libraries work closely together to identify, acquire and share resources throughout the campus.

## TEACHING METHODS

Legal training involves the learning of principles through discussion and of skills by practice. The student must be, by definition, an active participant in that process.

### Socratic or Inductive Teaching

The "case method" is the basic tool of traditional American legal education. This method involves the study and discussion of litigated cases. The teacher calls upon the student to respond in a stimulating question-and-answer dialogue, frequently involving several class members and often including more questions than answers. The learning experience occurs not only in the interchange between teacher and student, but also among the students themselves. The perceptive student will soon learn that a key to the realization of maximum benefit from these interchanges is the ability to listen with discrimination.

This process, applied skillfully by expert teachers and by students possessing a sense of awareness and curiosity, hones the minds of students, develops their respect for facts, and creates a sensitivity to essential differences among issues, policies, reasons, and arguments. Intensive and consistent daily preparation is necessary for students to participate effectively in this process.

### Problem Solving

In a portion of the first-year course, and in later courses, students are given practical legal problems. These problems may involve the drafting of legal documents or the formulation of a course of action for a hypothetical client.

### Seminars

By the time students reach their third year, and sometimes earlier, they will be prepared to engage in significant legal research in selected areas of specialization. A primary source for such experience will be seminars taught informally in small groups by professors who are experts in selected subjects. Frequently, a student will be expected to defend a seminar paper before classmates under circumstances that provide lively and constructive discussion.

### Clinical Experience

Of increasing importance in legal education is the role of practical, on-the-job training involving the legal problems of actual clients. Legal clinic courses provide valuable client counseling experience, as well as participation in actual trials and appeals under the supervision of a member of the faculty and a licensed attorney.

The clinic has offices in the Law Programs Center near the School of Law; representation is provided for students and indigent local residents. Both civil and certain referred criminal cases are accepted by the clinic.

Beginning in 2003-04, the School of Law will also offer a tobacco clinic in which students may participate in various tobacco control initiatives.

### Individual Research

During the second and third years, students will be permitted to engage in research and writing projects for credit under the supervision of, and in consultation with, a selected faculty member, in an area of particular interest to the student.

### Skills Classes

Many classes in the School of Law involve a significant skills component in which students are placed in a simulated client-based situation and asked to respond appropriately. The curriculum includes a number of specially designated skills classes that focus on practice skills. All law students are required to take at least one skills class prior to graduation.

## ADMISSION TO THE SCHOOL OF LAW

For complete details concerning admission to the University of Arkansas School of Law, see the *School of Law Catalog* or write to School of Law Office of Admissions, Robert A. Leflar Law Center, University of Arkansas, Fayetteville, AR 72701, telephone (479) 575-3102.

### General Information

Except for students in the “3/3 Programs” described later, applicants must have completed all requirements for a bachelor’s degree from an accredited institution prior to the date of enrolling in the School of Law.

All applicants must take the Law School Admission Test (LSAT) administered by Law School Admission Services.

Admission of most students is based on the applicant’s undergraduate grade-point average and his or her LSAT test score. However, the School of Law also seeks a diverse student body with a broad set of backgrounds, interests, life experiences, perspectives, qualifications and career objectives. In selecting a small percentage of applicants, therefore, the admissions committee may consider a number of factors relevant to a determination of how the applicant might contribute to such diversity within the School of Law.

There is no predetermined satisfactory grade-point average or law school admission test score. Admission is on a selective basis.

While admissions personnel are happy to answer any questions that an applicant may have, the interview as a device for the applicant to “sell” herself or himself is not a part of the admissions process. The admissions committee works only with the written materials in an applicant’s file.

### LSAT

The Law School Admission Test (LSAT) is given four times a year in Fayetteville and at other locations throughout Arkansas, as well as in other states. Arrangements may be made by writing to Law School Admissions Services, Box 2000, Newton, PA 18940. Applicants for admission are urged to take the test at least nine months prior to expected entrance to law school.

### LSDAS

The University of Arkansas participates in the Law School Data Assembly Service (LSDAS). The LSAT/LSDAS registration packet may be obtained by writing directly to Law School Admissions Services, Box 2000, Newton, PA 18940. The packet includes instructions for providing transcripts of scholastic work for analysis by the LSDAS. The applicant should see that the LSAT score and LSDAS reports are sent to this school.

### Pre-Law Study

No pre-law curriculum is prescribed at the University of Arkansas School of Law or at any other American law school. Experience has shown that students do equally well in law school and in law practice regardless of their differing educational backgrounds. As a result, no single “pre-law major” is required or even recommended.

Students in a position to structure their college curricula should select courses that emphasize analytical and problem-solving skills and courses in which written work is vigorously edited.

Arkansas admits applicants from a wide variety of college majors. The resulting diversity enhances and enriches the educational experience of all students.

### The Admission Process

The University of Arkansas School of Law admits one beginning class in August of each year. Applications for admission may be ob-

tained from the Office of Admissions, University of Arkansas School of Law, Robert A. Leflar Law Center, Fayetteville, Arkansas 72701.

Applications should be completed as early as possible. While applications are considered as long as there are openings in the entering class, few applications received after April 1 receive favorable action.

The admission process at Arkansas is a continuing one. As test reports and scores are received, admission decisions are made. It is impossible to give a final decision on some applicants until late spring.

An applicant whose admission has been approved will receive a tentative admission notice. The applicant will be required to deposit a \$75 pre-registration fee. This fee is not refundable but is applied to the regular registration fee when the student registers.

### Other Admission Information

Persons who have attended other law schools should not follow the above procedure but should apply to the associate dean for students at the School of Law as a transfer student, indicating previous attendance at another school. Failure to indicate such attendance will automatically void a tentative admission granted to such person.

A student may not register in the School of Law for any course without first complying with all admission requirements for regular law students.

### 3/3 Programs

The School of Law and the J. William Fulbright College of Arts and Sciences have agreed on a program that will enable outstanding students to enter law school after their third year of college. A student enrolled in the Fulbright College is eligible to begin study in the UA School of Law after the completion of at least 94 hours of college work if the following criteria are met:

1. he or she has completed all University, College, and major course requirements for their undergraduate degree,
2. he or she has acquired a cumulative grade-point average of at least 3.50, and
3. he or she has scored at least 159 on the Law School Admissions Test.

Such students will receive a bachelor of arts or a bachelor of science degree after the completion of sufficient hours of law school work to meet the regular requirements of Fulbright College. These students will then receive a juris doctor (J.D.) degree after completing the required number of hours of law school work.

In addition to the 3/3 program with the J. William Fulbright College of Arts and Sciences, the Law School has a similar program with the department of agricultural economics and agribusiness in the Dale Bumpers College of Agricultural, Food and Life Sciences. Exceptional students may enroll in the Law School in their fourth year of undergraduate study. Students will be required to have (1) completed at least 95 credit hours in the pre-law program, (2) a cumulative grade-point average in all college or university course work of at least 3.50 without grade renewal, and (3) an LSAT score of at least 159. The B.S.A. Agricultural Business degree will be granted after successfully completing 29 credit hours from the first year law school course work.

It is a requirement of the Law School’s accreditation standards that no student be admitted to the University of Arkansas School of Law until they have completed at least three-fourths of the work necessary for the baccalaureate degree. The requirements embodied in these 3/3 programs satisfy this requirement.

### Joint J.D./M.B.A. Program (Business Administration)

The School of Law and the Sam M. Walton College of Business cooperate in offering an opportunity for a student to pursue a juris doctor (J.D.) degree and a master’s of business administration (M.B.A.) degree concurrently. Students working to pursue their degrees concur-



rently must gain admission to both the School of Law and the Graduate School and be accepted into the program of study leading to the M.B.A. degree. If the student is accepted into both programs, a maximum of six hours of approved upper-level elective law courses may be used as duplicate credit toward the M.B.A. degree and a maximum of six hours of approved graduate courses in business administration may be used as duplicate credit toward the J.D. degree, thus reducing the total time necessary for completion of the degrees.

### **Joint J.D./M.P.A. Program (Public Administration)**

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 a juris doctor (J.D.) degree and a master's of public administration (M.P.A.) degree concurrently. Students must be admitted to the M.P.A. program, the School of Law, and the dual degree program. If a student seeks to enter the dual degree program after enrolling in either the law school or the M.P.A. program, he or she must obtain admission to the other degree program and the dual program during the first year of study.

The School of Law accepts a maximum of nine hours of M.P.A. courses to satisfy requirements for the J.D. 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 School of Law. For purposes of the M.P.A. degree, 15 hours of elective courses may be taken in the School of Law, provided they are in an area of concentration approved by the director of the M.P.A. program. Students must earn a grade of B or higher in any M.P.A. course offered for credit toward the J.D.

Students admitted to the dual degree program may commence their studies in either the School of Law or in 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 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.P.A. degree, he or she cannot count any 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 School of Law. The J.D. degree 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 alternately, six hours of additional coursework.

## **FINANCIAL INFORMATION**

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Students are expected to make sufficient financial arrangements for the first year of study without the necessity of seeking employment. All law students are required to be full-time students, and no law student is permitted more than 20 hours per week of employment. First-year students are strongly discouraged from working while enrolled in classes. First-year students are expected to adhere to a standard curriculum; also, some courses in the upper-division curriculum are required.

Applications for financial aid may be obtained from the Office of Financial Aid, University of Arkansas, Hunt Hall 114, Fayetteville, AR 72701, (479) 575-3806. This information must be submitted to the Office of Financial Aid by April 1. Specific fees and costs are listed in the *School of Law Catalog*.

## **TRANSFER STUDENTS**

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A law student who has received a degree from an approved college and thereafter has completed work with satisfactory scholarship in a law school accredited by the American Bar Association is eligible to be considered for transfer to the University of Arkansas School of Law. The amount of transfer credit to be granted will depend upon the quality of performance and the relation of completed courses to the program of this school. Only credits or units (not grades) are transferable in any case, and even credits will not be accepted for any course or other work in which a grade below 2.0 or the equivalent has been given from the other law school. To qualify for a degree, the student must complete the final two semesters of law study at the University of Arkansas School of Law.

Failure to disclose attendance at another college or law school or expulsion or suspension therefrom is sufficient grounds to require withdrawal.

## **VISITING STUDENTS**

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A student in good standing at another fully accredited law school may apply for admission as a visiting student. Enrollment restrictions may limit class selection, and visiting students are not eligible to receive degrees from the School of Law.

## **LAW (LAWW)**

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For course information, see the *School of Law Catalog*. Contact the School of Law Office of Student Affairs for a copy of the current catalog: University of Arkansas School of Law, Leflar Law Center, Waterman Hall 147, Fayetteville, AR 72701, (479) 575-3102.

# Reserve Officer Training Corps

## Air Force ROTC

319 Memorial Hall  
(479) 575-3651/3652  
E-Mail: rotc030@uark.edu

## Army ROTC

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## Professor of Aerospace Studies

Lt Col Jonathan D. Brown  
B.S., Mississippi Valley State University  
M.B.A., Golden Gate University

## Professor of Military Science and Leadership

Lt Col William H. Land III  
B.S., Ouachita Baptist University  
M.A., U.S. Army Command and General Staff College

## World Wide Web

Air Force ROTC  
<http://www.uark.edu/~afrotc>

Army ROTC  
<http://www.uark.edu/armyhog/>

The Reserve Officer Training Corps (ROTC) programs at the University of Arkansas provide physical and mental challenges that are not offered anywhere else on campus. The ROTC programs prepare young men and women for careers as professional military officers. In addition to academic studies, each service requires that all students attend a weekly leadership laboratory.

The freshman and sophomore courses are electives offered to male and female students who may earn four hours of academic credit in Aerospace Studies or up to six hours in Military Science. Absolutely no military obligation is incurred by non-scholarship students as a result of their enrollment in or completion of any or all of their freshman or sophomore ROTC courses.

## U. S. AIR FORCE ROTC

In addition to the first two years of academic study, the university, in cooperation with the U.S. Air Force, offers two years of advanced instruction in Aerospace Studies. The advanced instruction prepares students for the responsibilities and privileges of a commissioned officer. This advanced instruction offers three hours of academic credit per semester for Air Force cadets.

Air Force ROTC cadets must attend and successfully complete field training. Air Force ROTC cadets usually attend field training between their sophomore and junior years. Air Force ROTC cadets enrolled in the full four-year program attend a four-week session, whereas students entering the two-year program attend a six-week session. Air Force ROTC cadets may volunteer to attend light aircraft training, parachutist training, or various other professional development courses.

For students having a minimum of two academic years remaining in school (undergraduate, graduate, or a combination of the two), an alternate two-year program is offered. Students entering the two-year ROTC program must attend a six-week field training orientation during the summer prior to their last two years of college or between their junior and senior years. The student must successfully complete the summer camp to qualify for the advanced ROTC program. All veterans who have completed basic training and 180 days of service with any component of the U.S. Armed Forces may receive full credit for the freshman and sophomore courses and may enter ROTC at the advanced level when junior academic standing has been achieved.

Financial assistance is also available through multiple scholarship programs to qualified students enrolled in ROTC courses. Air Force ROTC offers four-, three-, and two-year scholarships to qualified students. If accepted, all scholarship students receive a monthly tax-free allowance ranging from \$250 to \$400, payment of all tuition expenses, textbook payment, and payment of certain other fees. Additional information and applications for this assistance may be obtained on the Web at <<http://www.afrotc.com>>. Engineering and nursing students are highly encouraged to apply.

A student who successfully completes the Advanced Course in Air Force ROTC and receives a degree will be awarded a reserve commission and will serve on active duty in the U. S. Air Force.

All textbooks, instructional material, and equipment required for ROTC courses are furnished at no cost to the student.

SEE PAGE 249 FOR U.S. AIR FORCE ROTC (AERO) COURSES

## U. S. ARMY ROTC

In addition to the first two years of academic study, the University, in cooperation with the U.S. Army, offers two years of advanced instruction in Military Science. The advanced instruction prepares students for the responsibilities and privileges of a commissioned officer. This advanced instruction offers four hours of academic credit per semester for Army cadets. Additionally, all students enrolled in the final two years of ROTC receive a monthly tax-free allowance ranging from \$250 to \$400.

Army ROTC cadets attend a paid five-week advanced camp between their junior and senior school year. Cadets may attend professional development training such as Leadership Internships, airborne, air assault, British Exchange program, northern warfare, and mountain warfare. During summer field training, cadets receive room and board.

For students having a minimum of two academic years in school remaining (undergraduate, graduate, or a combination of the two), an alternate two-year program is offered. Students entering the two-year ROTC program attend a five-week Leaders Training Course (LTC) during the summer. Rising juniors, seniors and graduate students who meet the U.S. Army Cadet Command's *Scholar-Athlete-Leader* criteria and are unable to attend the LTC may elect to participate in the Accelerated Cadet Commissioning Training (ACCT) program conducted on the UA campus.

Students with high school-level military schooling (ROTC, NDCC, or Military Academy) may qualify for the advanced ROTC program without completing the freshman or sophomore courses. All veterans who have completed basic training and 180 days of service with any component of the U.S. Armed Forces can receive full credit for the freshman and sophomore courses and may enter ROTC at the advanced level, once junior academic standing has been achieved.

Financial assistance is also available to qualified students enrolled in ROTC courses. The Army offers two-, two and one half-, three-, three

and one half-, and four-year scholarships. Freshman or sophomore students who are not enrolled in Army ROTC may qualify for on-campus two- or three-year scholarships. Juniors, seniors, and graduate students who have at least two full years of college remaining may also qualify for on-campus two- or three-year scholarships. Scholarships can be used to pay for graduate school. Scholarship students receive a monthly tax-free allowance ranging from \$250 to \$400, payment of all tuition expenses, textbook payment (\$600 per year), and payment of certain other fees. Additionally, all qualified four- and three-year scholarship winners may receive free room and board, provided they meet the University of Arkansas requirements for the Room and Board Scholarship.

Army ROTC scholarship and advanced course students must agree to successfully complete at least one semester of computer literacy, American military history, and communications prior to commissioning.

Army ROTC also offers a unique financial assistance program available to all non-scholarship Army ROTC Advanced Course students through the Simultaneous Membership Program (SMP). This program allows an Advanced Course student to be enrolled in Army ROTC while simultaneously serving with a Reserve or National Guard unit. Financial benefits of this program presently provide approximately \$600 to \$1,100 per month to enrolled students. Prior Service National Guard and Army Reserve students may also qualify for the Montgomery G.I. Bill, MGIB Kicker, the Veterans Administration Workstudy Program, Federal Tuition Assistance and/or the Arkansas Army National Guard Tuition Assistance Program. Army ROTC Scholarship Nurse Cadets may also receive reimbursement for expenses related to Nursing Uniforms, Immunizations, Clinical Fees, Nursing Malpractice Insurance and the NCLX-RN review and testing.

A student who successfully completes the Advanced Course in the Army ROTC program and receives a degree may be accepted for a regular or reserve commission in one of the sixteen branches of the Army.

All textbooks, instructional material, and equipment required for ROTC courses are furnished at no cost to freshmen and sophomore students. Junior and senior Army ROTC students must purchase textbooks only. All other equipment and materials will be furnished at no cost.

SEE PAGE 312 FOR U.S. ARMY ROTC (MILS) COURSES

# University Faculty

**NOTE:** The first date after the listing of each name indicates the year of first appointment at the University; the second date indicates the year of appointment to present faculty rank. Where they coincide, only one date is given.

- Ackerson, Michael Dean** – B.S.Ch.E., M.S.Ch.E. (University of Missouri-Rolla), Ph.D. (University of Arkansas), Associate Professor of Chemical Engineering, 1988, 1992.
- Adams, Charles H.** – B.A. (Tulane University of Louisiana), M.A., Ph.D. (University of Virginia), Associate Professor of English, 1986, 1992.
- Adams, Douglas J.** – B.A. (Augsburg College), M.A., Ph.D., (University of Arizona), Associate Professor of Sociology, 1995, 2002.
- Adams, Richard C.** – B.A. (University of Pennsylvania), Ph.D. (University of Iowa), Assistant Professor of English, 2001.
- Adkins, Jr., Charles W.** – B.S. (University of Central Arkansas), L.E. (U.S. Army Logistics Management College), Major (U.S. Army, Quartermaster Corps), Assistant Professor of Military Science and Leadership, 2001.
- Adler, Jacob** – A.B., Ph.D. (Harvard University), Associate Professor of Philosophy, 1984, 1991.
- Ahrendsen, Bruce L.** – B.S. (Iowa State University), M.Econ., Ph.D. (North Carolina State University), Associate Professor of Agricultural Economics and Agribusiness, 1990, 1996.
- Aiken, Glen E.** – B.S., M.S. (Texas A&M University), Ph.D. (University of Florida), Adjunct Assistant Professor of Agronomy, 1993.
- Akeroyd, John R.** – B.A. (University of Louisville), M.A., Ph.D. (Indiana University), Professor of Mathematical Sciences, 1986, 1999.
- Alexander, Jerry W.** – B.A. (Western Kentucky University), M.A. (Texas Tech University), Visiting Assistant Professor of Operations Management, 2002.
- Alguire, Mary S.** – B.S. (Marquette University), M.S. (University of Arkansas), Instructor of Information Systems, 1982.
- Allen, Carolyn Henderson** – B.S. (Alabama State University), M.S. (Clark Atlanta University), Professor and Dean of University Libraries, 2000.
- Allen, Charles T.** – B.S., M.S. (Texas Tech University), Ph.D. (Louisiana State University), Adjunct Associate Professor of Entomology, 1997.
- Allen, Myria W.** – B.A., M.A., Ph.D. (University of Kentucky), Associate Professor of Communication, 1993, 1999.
- Allison, Neil T.** – B.S. (Georgia College), Ph.D. (University of Florida), Associate Professor of Chemistry and Biochemistry, 1980, 1985.
- Aloysius, John A.** – B.S. (University of Colombo, Sri Lanka) Ph.D. (Temple University), Associate Professor of Information Systems, 1995, 2002.
- Amason, Patricia** – B.S.E. (University of Arkansas), M.A. (University of Kentucky), Ph.D. (Purdue University), Associate Professor of Communication, 1994, 2000.
- Anand, Vikas** – M.Sc. (Birla Institute of Technology), M.B.A. (Indian Institute of Foreign Trade), Ph.D. (Arizona State University), Assistant Professor of Management, 1999.
- Anders, Merle M.** – B.S. (Iowa State University of Science and Technology), M.S., Ph.D. (University of Hawaii), Research Assistant Professor of Rice Cropping Systems, 1998.
- Andersen, Craig R.** – B.S. (Augustana College), M.S., Ph.D. (University of Minnesota), Assistant Professor of Horticulture, 1985.
- Anderson, Glenn B.** – B.A. (Gallaudet College), M.S. (University of Arizona), Ph.D. (New York University), Professor of Rehabilitation Education, 1982, 1991.
- Anderson, Sarah L.** – B.S., M.S., Ed.D (Oklahoma State University), Professor and Extension Family Life Specialist, 1997.
- Ang, Simon S.** – B.S.E.E. (University of Arkansas), M.S.E.E. (Georgia Institute of Technology), Ph.D. (Southern Methodist University), P.E., Professor of Electrical Engineering, 1988, 1995.
- Anthony, Nicholas B.** – B.S., M.S. (Ohio State University), Ph.D. (Virginia Polytechnic Institute and State University), Professor of Poultry Science, 1987, 2000.
- Antoine, Pierre Ph.** – B.S. (University of Louvain, Belgium), Ph.D. (University of Minnesota), Adjunct Professor of Agronomy, 1987.
- Apon, Amy W.** – B.S.Ed., M.A., M.S. (University of Missouri-Columbia), Ph.D. (Vanderbilt University), Associate Professor of Computer Science and Computer Engineering, 1998, 2002.
- Apple, Jason K.** – B.S. (Oklahoma State University), M.S., Ph.D. (Kansas State University), Associate Professor of Animal Science, 1995, 2001.
- Apple, Laurie Marie McAlister** – B.S., M.S. (University of Arkansas), Ph.D. (Oklahoma State University), Assistant Professor of Human Environmental Sciences, 2000.
- Arenberg, Nancy** – B.A. (Grinnell College), M.A. (University of Illinois, Champaign-Urbana), Ph.D. (University of Arizona, Tucson), Associate Professor of Foreign Languages, 1996, 2002.



- Armstrong, Deborah J.** - B.A. (California State University), M.B.A. (Availa College), Ph.D. (University of Kansas), Assistant Professor of Information Systems, 2001.
- Armstrong, Edward P.** - B.A. (Indiana University), M.A., Ph.D. (Pennsylvania State University), Assistant Professor of English, 1997.
- Armstrong, Ken R.** - B.A. (University of Arkansas), Instructor of Information Systems, 2001.
- Arnold, Mark E.** - B.S., Ph.D. (Northern Illinois University), Associate Professor of Mathematical Sciences, 1993, 1999.
- Arthur, Nolan L.** - B.S., M.S., Ed.D. (Oklahoma State University), Associate Professor of Agricultural & Extension Education, 1975, 1984.
- Asfahl, C. Ray** - B.S.I.E. (Oklahoma State University), M.S.I.E. (Stanford University), Ph.D. (Arizona State University), P.E., C.S.P., Professor of Industrial Engineering, 1969, 1975.
- Ashton, Dub** - B.S.B.A., M.B.A. (Memphis State University), Ph.D. (University of Georgia), Associate Professor of Marketing and Transportation, 1981.
- Aslin, Larry** - B.A., M.A. (University of Missouri-Columbus), Research Associate Professor of Communication Disorders, 1975, 1988.
- Atkinson, Richard B.** - B.A. (Duke University), M.Div., J.D. (Yale University), Associate Professor of Law, 1975, 1981.
- Babcock, Robert E.** - B.S.Pet.E., M.Ch.E., Ph.D. (University of Oklahoma), P.E., Professor of Chemical Engineering, 1965, 1974.
- Bacon, Robert K.** - B.S.A., M.S. (University of Arkansas), Ph.D. (Purdue University), Professor of Agronomy, 1984, 1993.
- Bailey, Alberta S.** - B.A. (Miles College), M.S.L.S. (Case Western Reserve University), Professor and Librarian, 1979, 1989.
- Bailey, Carlton** - B.A. (Talladega College), J.D. (University of Chicago), Associate Professor of Law, 1978, 1983.
- Bailey, Claudia Frazier** - B.S. (Madison College), M.A. (Oberlin College), Ph.D. (Bryn Mawr College), Associate Professor of Biological Sciences, 1970, 1977.
- Bailey, Dennis L.** - B.A. (David Lipscomb College), M.A. (University of Illinois), Ph.D. (University of Oklahoma), Associate Professor of Communication, 1971, 1976.
- Bailey, William C.** - B.A., M.A., Ph.D. (Texas Tech University), Associate Professor of Human Environmental Sciences, 1991, 1997.
- Bajwa, Sreekala G.** - B.S., Ag.E. (Kerala Agriculture University, Tavanur, India), M.S. Ag.E. (Indian Institute of Technology, Kharagpur, India), Ph.D. (University of Illinois), Assistant Professor of Biological and Agricultural Engineering, 2001.
- Baker, Allen** - B.S., M.S. (University of Arkansas), Instructor in Computer Science and Computer Engineering.
- Balda, Juan C.** - B.Sc.E.E. (Universidad Nacional del Sur), Ph.D. (University of Natal), P.E., Professor of Electrical Engineering, 1989, 1999.
- Baldwin, Vernice G.** - B.S., M.S. (University of Arkansas), Instructor/Director of Nursery School for the School of Human Environmental Sciences, 1996.
- Balog, Janice M.** - B.S. (Purdue University), M.S. (University of Rhode Island), Ph.D. (Purdue University), Research Assistant Professor of Poultry Science, 1992, 1998.
- Bamberger, Uta** - M.A. (University of California, Santa Barbara), Ph.D. (University of Massachusetts), Assistant Professor of Foreign Languages, 1997.
- Barlow, Fred** - B.S. (Emory University), M.S., Ph.D. (Virginia Polytechnic Institute and State University), Assistant Professor of Electrical Engineering, 2000.
- Barrentine, James L.** - B.S., M.S. (University of Arkansas), Ph.D. (Purdue University), Professor of Agronomy, 1998.
- Barta, Kathleen M.** - B.S. (MN.arquette University), M.S. (Boston College), Ed.D. (University of Arkansas), Associate Professor of Nursing, 1984, 1998.
- Batson, Donald W.** - B.A., M.Ed. (Central State University), M.L.S. (Emporia Kansas State College), Associate Professor and Associate Librarian, 1976, 1980.
- Batzter, Stephen A.** - B.S.M.E. (Michigan Technological University), M.S.M.E. (GMI Engineering and Management Institute), Ph.D. (Michigan Technological University), Assistant Professor of Mechanical Engineering, 1999.
- Beard, Lonnie R.** - B.A. (Arkansas State University), J.D. (University of Arkansas), LL.M. (New York University), Professor of Law, 1985, 1991.
- Beatty, Frances G.** - B.S. (Pennsylvania State University), M.A. (Boston University), Associate Professor of Landscape Architecture, 2001.
- Beaupre, Steven J.** - B.S., M.S. (University of Wisconsin), Ph.D. (University of Pennsylvania), Associate Professor of Biological Sciences, 1995, 2001.
- Beavers, Gordon** - B.S., M.S. (University of Texas), Ph.D. (Indiana University), Associate Professor of Computer Science and Computer Engineering, 2002.
- Behrend, Douglas A.** - B.A. (Kalamazoo College), Ph.D. (University of Minnesota), Associate Professor of Psychology, 1989, 1995.
- Beike, Denise R.** - B.A., Ph.D. (Indiana University), Associate Professor of Psychology, 1995, 2000.
- Beitle, Robert R.** - B.S.Ch.E., M.S.Ch.E., Ph.D. (University of Pittsburgh), Associate Professor of Chemical Engineering, Adjunct Associate Professor of Biological and Agricultural Engineering, 1993, 1998.
- Bell, Steven M.** - B.A. (University of Kansas), M.A. (University of Kentucky), Ph.D. (University of Kansas), Associate Professor of Foreign Languages, 1992, 1996.
- Bellaiche, Laurent** - B.S., M.S., Ph.D. (University of Paris VI, France), Assistant Professor of Physics, 1999.
- Beller, Caroline** - B.S. (Florida Atlantic University), M.Ed., Ph.D. (Texas A&M University), Assistant Professor of Curriculum and Instruction, 1988.
- Benamon, Johnny C.** - M.S., M.P.A. (University of Mississippi), Visiting Assistant Professor of Operations Management, 2000.
- Bering, J.M.** - B.A. (Florida Atlantic University), M.S. (University of Louisiana at Lafayette), Ph.D. (Florida Atlantic University), Assistant Professor of Psychology, 2002.
- Bernhardt, John L.** - B.S., M.S. (East Carolina University), Ph.D. (Clemson University), Adjunct Senior Research Associate of Rice Insects, 1979.
- Berthelot, Ronald J.** - B.S. (Southeastern Louisiana University), M.S., Ed.D. (University of Tennessee), Visiting Assistant Professor of Operations Management, 1993.
- Besonen, Philip** - B.S., M.A. (University of Minnesota), Ed.D. (Brigham Young University), Professor of Secondary Education, 1973, 1985.
- Bhat, Deepak G.** - B.S.Met.E. (University of Poona, India), M.Tech.Met.E. (Indian Institute of Technology, Bombay), Ph.D. (University of Southern California), Erma Fitch and Raymond

- F. Giffels Chair and Professor of Mechanical Engineering, 2001.
- Biggs, Bobbie T.** – B.S.H.E., M.S. (University of Arkansas), Ph.D. (Texas A&M University), Professor of Vocational Education, 1979, 2000.
- Blackwell, Marlon M.** – B.Arch (Auburn University), M.Arch (Syracuse University), Professor of Architecture, 1992, 2002.
- Bobbitt, Donald R.** – B.S. (University of Arkansas), Ph.D. (Iowa State University), Professor of Chemistry and Biochemistry, 1985, 1993.
- Bonacci, Jeffrey A.** – B.S. (University of Akron), M.S. (West Virginia University), D.A. (Middle Tennessee State University), Clinical Assistant Professor of Kinesiology, 2000.
- Bonanno, F. Ramon** – B.S. (U.S. Military Academy), M.S. (Iowa State University), Ph.D. (University of Arizona), Visiting Assistant Professor of Operations Management, 1994.
- Booker, M. Keith** – B.A. (Vanderbilt University), M.S., M.A. (University of Tennessee), Ph.D. (University of Florida), Professor of English, 1990, 1997.
- Boone, Steven E.** – B.A., M.Ed., Ph.D. (University of Arkansas), Research Professor of Rehabilitation, 1985, 1994.
- Boss, Stephen K.** – B.S. (Bemidji State University), M.S. (Utah State University), Ph.D. (University of North Carolina, Chapel Hill), Associate Professor of Geology, 1996, 2002.
- Bottje, Walter G.** – B.S. (Eastern Illinois University), M.S. (Southern Illinois University), Ph.D. (University of Illinois), Professor of Poultry Science, 1985, 1993.
- Bourland, Fred M.** – B.S.A., M.S. (University of Arkansas), Ph.D. (Texas A&M University), Professor of Agronomy at Northeast Research and Extension Center, 1988.
- Bouwman, Marinus J.** – B.S. (Eindhoven University of Technology), M.S., Ph.D. (Carnegie-Mellon University), Associate Professor of Accounting and Ralph McQueen Chair of Accounting, 1992, 1993.
- Boyd, John W.** – B.S. (Eastern Illinois University), M.S. (University of Illinois), Ph.D. (Oklahoma State University), Extension Weed Scientist, 1982, 1988.
- Boyer, Mark E.** – B.S. in Landscape Architecture (University of Kentucky), M. in Landscape Architecture (Louisiana State University), Assistant Professor of Landscape Architecture, 1998.
- Brady, Pamela L.** – B.S., M.S. (University of Arkansas), Ph.D. (University of Tennessee), Adjunct Associate Professor of Food Science, 1999.
- Brady, Robert M.** – B.S. (Murray State University), M.A. (Western Kentucky University), Ph.D. (University of Michigan), Associate Professor of Communication, 1979, 1985.
- Brahana, John Van** – A.B. (University of Illinois), M.A., Ph.D. (University of Missouri), Professor of Geosciences (Geology), 1999.
- Bramwell, Keith** – B.A. (Brigham Young University), M.S., Ph.D. (University of Georgia), Extension Poultry Specialist III in Poultry Science, 2000.
- Brazzell, Johnetta** – B.A. (Spellman College), M.A. (University of Chicago), Ph.D. (University of Michigan), Adjunct Associate Professor of Higher Education, 2002.
- Breckenridge, Leigh Ann** – B.S.N. (Mississippi College), M.S.N. (University of Kentucky), Instructor of Nursing, 1999.
- Breeding, Steve** – B.S., M.S., D.M.V. (North Carolina State University), Adjunct Assistant Professor of Poultry Science, 1998.
- Brescia, William F., Jr.** – B.A. (Wartburg College), M.S. (University of Wisconsin), Ph.D. (Indiana University), Assistant Professor of Educational Technology, 2000.
- Brewer, Dennis W.** – B.A. (Sterling College), M.A., Ph.D. (University of Wisconsin), Professor of Mathematical Sciences, 1975, 1990.
- Brill, Howard W.** – A.B. (Duke University), J.D. (University of Florida), LL.M. (University of Illinois), Vincent Foster Professor of Legal Ethics and Professional Responsibility, 1975, 1982.
- Brinkmeyer, Robert H. Jr.** – B.A. (Duke University), M.A., Ph.D. (University of North Carolina-Chapel Hill), Professor of English, 2000.
- Brister, Roy** – B.S., M.S., Ph.D. (Texas A&M University), Adjunct Professor of Poultry Science, 1994.
- Bristow, Susan** – B.S.B.A., M.B.A. (University of Arkansas), Instructor of Information Systems, 2002.
- Brittenum, Judy B.** – B.S. (University of Arkansas), M.L.A. (Louisiana State University), Associate Professor of Landscape Architecture, 1989, 1994.
- Britton, Charles R.** – B.A., M.A. (University of Missouri-Columbia), Ph.D. (University of Iowa), Professor of Economics, 1969, 1978.
- Brody, Myron** – B.F.A. (Philadelphia College of Art), M.F.A. (University of Pennsylvania), Professor of Art, 1985.
- Broggi, Alessandro** – B.A. (University of Florence, Italy), M.A. (Ohio University), Ph.D. (University of Florence, Italy), Ph.D. (Ohio University), Assistant Professor of History, 2002.
- Brooks, Catherine A.** – B.S. (University of Texas), M.Ed., Ed.D. (University of Arkansas), Assistant Professor of Vocational and Adult Education, 1999, 2001.
- Brown, A. Hayden, Jr.** – B.S.A. (Tennessee Technological University), M.S., Ph.D. (University of Tennessee), Professor of Animal Science, 1977, 1988.
- Brown, Arthur V.** – B.S., M.A. (Sam Houston State University), Ph.D. (North Texas State University), Associate Professor of Biological Sciences, 1974, 1981.
- Brown, Barry S.** – B.S. (Brooklyn College), M.A., Ph.D. (Michigan State University), University Professor of Kinesiology, 1969, 1991.
- Brown, Jonathan D.** – B.S. (Miss Valley State University), M.B.A. (Golden Gate University), Professor of Aerospace Studies, 2001.
- Brown, Michael A.** – B.S., M.S., Ph.D. (Oklahoma State University), Adjunct Professor of Animal Science, 1998.
- Brown, Norma N.** – B.A. (West Texas State University), M.S.A. (University of Arkansas), C.P.A., Instructor in Information Systems, 1984.
- Brown, Randy L.** – B.S. (University of Missouri-Rolla), Ph.D. (University of Wisconsin), P.E., Associate Professor of Electrical Engineering, 1981, 1988.
- Brown, William D.** – B.S.E.E. (University of Arkansas), M.S.E.E. (Pennsylvania State University), Ph.D. (University of New Mexico), P.E., University Professor of Electrical Engineering, 1977, 1995.
- Broyles, John F.** – B.S. (Georgia Institute of Technology), Professor of Kinesiology, 1970.
- Brummer, Chauncey E.** – B.A. (Howard University), J.D. (University of Kentucky), Professor of Law, 1982, 2003.
- Brusstar, L. Terry** – B.S.E. (Maryville College), M.A., Ph.D. (Texas Woman's University), Professor of Dance Education, 1978, 1992.

- Bryant, Kelly J.** – B.S., M.S. (University of Arkansas), Ph.D. (Texas A & M), Adjunct Assistant Professor of Agricultural Economics and Agribusiness, 1993.
- Brye, Kristofor R.** – B.S. (University of Wisconsin – Stevens Point), M.S., Ph.D. (University of Wisconsin – Madison), Assistant Professor of Crop, Soil and Environmental Sciences, 2001.
- Buescher, Ronald W.** – B.S., M.S., Ph.D. (Purdue University), Professor of Food Science, 1973, 1981.
- Buffington, Jack E.** – B.S.C.E. (University of Arkansas), M.S.C.E. (Georgia Tech University), Research Professor of Civil Engineering, 1996.
- Bukey, Evan B.** – B.A. (Ohio Wesleyan University), M.A., Ph.D. (Ohio State University), Professor of History, 1969, 1986.
- Burch, George V.** – B.S. (Southwest Missouri State University), M.S., Ed.D. (University of Arkansas), Adjunct Assistant Professor of Agricultural and Extension Education, 1993.
- Burgos, Nilda R.** – B.S. (Visayas State College of Agriculture-Philippines), M.S., Ph.D. (University of Arkansas), Assistant Professor of Crop, Soil and Environmental Sciences, 1998.
- Burian, Steven J.** – B.S.C.E. (University of Notre Dame), M.S.E., Ph.D. (University of Alabama), Assistant Professor of Civil Engineering, 2000.
- Burleigh, Joseph G.** – B.S. (University of Southwest Louisiana), M.S. (Louisiana State University), M.S. (University of Central Arkansas), Ph.D. (Louisiana State University), Adjunct Professor of Entomology, 1982, 1992.
- Buron, Bill** – RNC, CS, FNP-C, B.S.N. (Southwest Missouri State University), M.S.N. (University of Missouri, Kansas City), Instructor of Nursing, 2000.
- Burris, Sidney** – B.A. (Duke University), M.A., Ph.D. (University of Virginia), Professor of English, 1986, 2002.
- Burton, W. Scot** – B.S.B.A., M.B.A. (University of Texas), Ph.D. (University of Houston), Professor of Marketing and Transportation and Wal-Mart Chair in Marketing, 1993, 1997.
- Bushkuhl, John Francis** – B.S.Ch.E. (University of Arkansas), Visiting Instructor in Chemical Engineering, 1994.
- Byers, Robert** – B.M.Ed., (University of Central Arkansas), M. of Landscape Architecture, (Louisiana State University), Project Program Specialist, 1992.
- Caldwell, Charles W.** – B.S.E.E., M.S.E.E. (University of California), Ph.D. (Case Western Reserve University), P.E., Associate Professor of Electrical Engineering, 1972, 1977.
- Caldwell, Mary E.** – B.A. (University of California, Berkeley), M.B.A. (University of Arkansas), C.P.A., Instructor in Accounting, 1983.
- Caldwell, Sarah** – University of Arkansas; Hendrix College; New England Conservatory; Boston University Opera Workshop, head; Opera Company of Boston, founder. Distinguished Professor of Music, 1999.
- Callahan, Carolyn M.** – B.S. (Ohio Northern University), M.S. (Bowling Green State University), Ph.D. (Michigan State University), Professor of Accounting and Doris M. Cook Chair in Accounting, 2001.
- Candido, Joseph D.** – B.A. (Colby College), M.A. (University of New Hampshire), Ph.D. (Indiana University), Professor of English, 1979, 1997.
- Cantrell, Andrea E.** – B.A. (American University), M.L.S. (University of Maryland), Professor and Librarian, 1985, 1995.
- Cantrell, Chyrle** – B.S. (California State University), M.S. (San Diego State University), Ph.D. (University of Northern Colorado), Assistant Clinical Professor, 2002.
- Capella, Michelle Elizabeth** – B.S. (Florida State University), M.S. Mississippi State University), Ph.D. (University of Arkansas), Research Assistant Professor, 2002.
- Capogna, Luca** – B.S. (Second University of Rome), Ph.D. (Purdue University), Assistant Professor of Mathematical Sciences, 1999.
- Carder, Sarah** – B.S.E., M.S.E. (Henderson State University), Ed.D. (University of Arkansas), Visiting Assistant Professor of Vocational and Adult Education, 1995.
- Carmichael, John Scott** – B.S. (U.S. Naval Academy), M.A. (Naval War College), M.S. (University of Arkansas), Visiting Assistant Professor of Operations Management, 1999.
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# Appendix A

## STUDENT RESIDENCE STATUS FOR TUITION AND FEE PURPOSES

Board Policy 520.8 (January 18, 1985, revised)

The full text of the University of Arkansas Board of Trustees policy statement 520.8, Student Residency Status for 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 that provides support for the educational services provided by the University.

#### II. Initial Classifications

- A. 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.

- B. 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 that will be applied in making the determination of residence.
- C. 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.
- D. 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.

- E. 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.
- F. 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).
- G. The six-month period required in paragraph A of these regulations may be waived for persons, their spouse, and their unmarried children who have not yet attained the age of 23 (dependents are the spouse and unmarried children who are legal dependents as defined by the IRS) and who move to Arkansas with attendance at the University only a by-product of the primary purpose of establishing domicile in this state.
- H. 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.
- I. Marriage is recognized as emancipation for both females and males.
- J. 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

- A. 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).
- B. 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

- A. 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.
- B. 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.
- C. 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.
- D. 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.
- E. Determination of domicile will be based on a review of all pertinent facts, evidence, and circumstances that 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. Appli-

cations 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 Office of the Registrar, 146 Silas H. Hunt Hall.

#### Resident Status of Native Americans

Board Policy 520.1, “Waiver of Non-Resident Tuition for Native Americans.” (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.

#### Resident Status of Members of the Armed Forces and Their Dependents

Board Policy 520.7, “Fees for Members of Armed Forces and Dependents.” (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 12 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 (the spouse and unmarried children who are legal dependents of the military person as defined by the IRS), 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 the dependents (the spouse and unmarried children who are legal dependents of the military person as defined by the IRS), 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.

#### Resident 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, Board Policy 520.10 states, “Residents of Texarkana, Texas and Bowie County, Texas, will be classified as in-state students for University fee purposes at the University of Arkansas.”

# Appendix B

## GLOSSARY

**Academic Probation.** A status resulting from unsatisfactory grades.

**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. See Orientation and Registration.

**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.

**Audit.** To take a course without credit.

**Adviser.** A faculty member assigned to a student to advise that student on academic matters that include degree requirements and selection of courses.

**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. Commonly referred to as the "Racing Form."

**College or School.** One of eight major divisions within the University that offers specialized curricula.

**Concentration.** A sub-set of a major's requirements leading to a graduate or bachelor's degree.

**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.

**Corequisite.** A course that must be taken at the same time as the course described.

**Course.** A unit of academic instruction.

**Course Deficiencies.** Lacking required units of study in high school. See Admission.

**Course Load.** The number of semester credit hours a student may schedule in a given term.

**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.** A complete course of study inclusive of all university, college and departmental requirements.

**Department.** Division of faculty or instruction within a college, such as Department of Accounting within the Sam M. Walton College of Business Administration.

**Drop/Add.** Official dropping or adding of courses for which students are registered during specified times as published in the schedule of classes.

**Elective.** A course not required, but one that a student chooses to take.

**Equivalent.** A course allowed in place of a similar course in the same academic discipline. May require approval by an academic dean.

**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.

**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.

**Laboratory.** Descriptive of work other than class work, such as experimentation and practical application.

**Lecture.** A class session in which an instructor speaks on a specific topic.

**Major.** A main or primary discipline in which a student completes a designated number of courses and hours of credit.

**Minor.** A second discipline or area of study in which a student concentrates in addition to the student's major; each approved minor requires a minimum of 15 hours 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.

**Pre- or corequisite.** A course or requirement that must be completed before or during the term when the described course is taken.

**Probation, Academic.** A status resulting from unsatisfactory grades.

**Registration.** Enrollment at the beginning or prior to the beginning of a semester, including selection of classes and payment of fees and tuition.

**Registration Fee.** A fee paid by all students who register for classes. (Only out-of-state students pay a tuition fee.)

**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.



**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.

**Student Number.** A number given to each student as a permanent identification number for use at the University.

**Summer Sessions.** Periods of time during the summer when course work is offered. (See the calendar or the summer class schedule for specific times and dates.)

**Suspension.** A status in which students are not permitted to register for courses for a specified time period.

**Syllabus.** An outline or summary of the main points of a course of study, lecture, or text.

**Transcript.** A copy of a student's academic record, mainly intended for communicating information from one institution to another.

**Tuition.** A fee charged to out-of-state students.

**Undeclared Major.** Designation indicating students who have not selected a major.

**Undergraduate Study.** Work taken toward earning an associate or a baccalaureate degree.

**Withdrawal.** Official withdrawal from all courses during a semester at the University.

# Course Descriptions

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## HOW TO READ A COURSE DESCRIPTION

Courses listed in this section describe all courses (except School of Law 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 is comprised of the following elements, in order:

**Course Prefix:** This alpha descriptor is the first identifying part of a course. This four-digit code represents the course prefix name. Usually the course prefix will be the same as the department offering the course, 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 foreign languages.

**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 standing see Student Standing on page 31.)

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 (see Courses that Do Not Count Toward Degrees on page 30.)

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 parenthesis after the course title.

The first three digits of the number are the same for corequisite courses (for example, the lecture course, and the corequisite lab or drill).

**Course Suffix:** A suffix to the course number further identifies the specific type of instruction:

- D - Drill or Discussion
- L - Laboratory
- H - Honors Course
- E - Honors Drill or Discussion
- 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:** Also inside the parentheses following the course title are letters indicating which semester 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 (I or IR) will be offered irregularly .

**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. 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.

Pre- or Corequisite are requirements that if not taken prior to enrolling in a course, they 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 for entry into specific courses should consult their academic adviser. Students may be dropped from courses for which they do not have the necessary requisites.

## (AAST)

### AFRICAN-AMERICAN STUDIES

**AAST499V African American Studies Seminar (1-6)** (FA, SP, SU) Explores the various aspects of the African-American experience as it relates to the development of black and white relationships in American society and the world at large. (May be substituted for AAST 2003 with permission). (Same as DRAM 4463) Prerequisite: second semester sophomore standing.

## (ACCT) ACCOUNTING

**ACCT2013 Introduction to Accounting Information I** (FA, SP, SU) Introduction of accounting as an information system with emphasis on processing and presenting information in the form of financial statements for use in decision making. Pre- or Corequisite: ISYS 1121L.

**ACCT2023 Introduction to Accounting Information II** (FA, SP, SU) Introduction of accounting as an information system with emphasis on resource allocation and production decisions within an entity. Prerequisite: ACCT 2013.

**ACCT3003 Financial and Administrative Accounting** (FA, SP, SU) Managerial accounting for those needing more than perfunctory knowledge of accounting, but less than demanded of career accountants.

**ACCT3013 Accounting View of Economic Events** (FA, SP) This course examines the relationship between economic events and the accounting view of those events. It explores the information that is captured by various accounting models, and information that is ignored. The course emphasizes business processes, double entry accounting, and computer-based accounting information systems. Prerequisite: WCOB 2013, WCOB 2023, WCOB 2033 and WCOB 2043, each with a grade of “C” or better.

**ACCT3533 Accounting Technology** (FA, SP) This course provides an overview of accounting information systems and illustrates the importance of technology to accountants. Students are exposed to a variety of information technologies, including manual, file-oriented, and database systems. The relative advantages and disadvantages of each type of system are highlighted and discussed. Pre- or Corequisite: ACCT 3721L. Prerequisite: ACCT 3013 with a grade of “C” or better.

**ACCT3613 Managerial Uses of Accounting Information** (FA, SP) Use of accounting information for managerial decisions in a changing, global environment. Identifying the specific information needs of managerial decisions, focusing on the role of both financial and non-financial accounting information within the context of a continually changing information system technology. Covers business as well as non-profit and governmental organizations. Prerequisite: WCOB 2013 and WCOB 2023 and WCOB 2033 and WCOB 2043 each with a grade of “C” or better.

**ACCT3723 Financial Reporting and Analysis** (FA, SP) This course is designed to develop the necessary skills and knowledge for the analysis and interpretation of corporate financial statements. To effectively evaluate financial statement information, students must have a thorough understanding of the corporate business environment, as well as the accounting principles underlying financial reporting. Prerequisite: ACCT 3013 or ACCT 3721L, each with a grade of “C” or better.

**ACCT3721L Financial Accounting Computer Laboratory** (FA, SP) Introduction to application of accounting computerized record keeping systems. Emphasizes the recording of transactions and generation of financial reports in a business environment. Prerequisite: ACCT 2013 and ACCT 2023 and ISYS 1121L each with a grade of “C” or better.

**ACCT3843 Fundamentals of Taxation** (FA, SP) An overview of the basic concepts of taxation, exploring the various types of taxes (with emphasis on the Federal Income tax) and the impact of the taxes on individuals, business entities, and nonprofit organizations. Prerequisite: ACCT 3013 with a grade of C or better.

**ACCT4003H Accounting Honors Colloquium** (IR) Explores events, concepts and/or new developments in the field of accounting. Prerequisite: Senior standing.

**ACCT410V Special Topics in Accounting (1-3)** (IR) Explore current events, concepts and new developments relevant to Accounting not available in other courses. May be repeated. Prerequisite: WCOB 2013 and



WCOB 2023 and WCOB 2033 and WCOB 2043 each with a grade of "C" or better.

**ACCT4673 Product, Project and Service Costing (FA, SP)** Cost systems with emphasis on information generation for cost management of products, projects and services. Prerequisite: ACCT 3533 and ACCT 3613 each with a grade of "C" or better.

**ACCT4753 Generally Accepted Accounting Principles (FA, SP)** The origins, uses, and application of generally accepted accounting principles. Emphasizes researching technical accounting pronouncements for application to external financial reporting issues. Prerequisite: graduate standing or ACCT 3723 with a grade of "C" or better.

**ACCT4963 Operational Auditing (FA, SP)** The audit of efficiency, effectiveness, and performance of business and nonbusiness entities. Includes coverage of performance auditing techniques and application of these techniques to financial and nonfinancial functions. Prerequisite: senior standing, WCOB 3016 and completion of all junior-level BA core and completion of junior-level accounting courses with a grade of "C" or better.

**ACCT5112 Introduction to Financial Accounting (FA)** Fundamentals of financial accounting, accumulation and reporting of data that show the results of operations and financial positions for use by creditors, investors, regulators, managers, and others in their evaluation of the organization. Prerequisite: graduate standing.

**ACCT5122 Introduction to Management Accounting (FA)** Introduction to cost terminology, concepts, and measurements leading to product costs, cost control, and budgeting. Prerequisite: ACCT 5112 with a grade of "C" or better.

**ACCT5413 Accounting Issues for Restructurings (FA)** Integrated course that 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 4753 with a grade of "C" or better.

**ACCT5433 Fraud Prevention and Detection (FA)** 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. Prerequisite: ACCT 5112 and ACCT 5122 and ISYS 3333 with a grade of "C" or better.

**ACCT5443 Asset Management (SP)** Acquisition and management of inventories, tangible capital assets, and intangible assets. Included are issues such as acquisition processes, internal controls, system requirements, accounting measurements, inventory models, re-engineering, capital budgeting, and tax implications. Prerequisite: ACCT 5112 and ACCT 5122 and ISYS 3333 each with a grade of "C" or better.

**ACCT5463 Contemporary Accounting Issues (SP)** Cross-functional seminar on emerging issues in accounting. Prerequisite: ACCT 5413 and ACCT 5433.

**ACCT549V Special Topics in Accounting (1-3) (FA, SP, SU)** Seminar in current topics not covered in other courses. Course is taught in separate 1-hour units, each with a different topic and instructor. Students may enroll in one or more units.

**ACCT5523 Advanced Accounting Information Systems (SP)** 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: ACCT 5112 and ACCT 5122 and ISYS 3333 with a grade of "C" or better.

**ACCT5873 Advanced Taxation (FA)** A review of the more complex tax issues, focusing on the tax problems encountered by various forms of business entities. Prerequisite: ACCT 3843 or equivalent with a grade of "C" or better.

**ACCT5883 Individual Tax Planning (SP)** A review of the financial planning opportunities available to individuals, focusing on tax implications of personal business decisions. Prerequisite: ACCT 5112 and ACCT 5122 and ISYS 3333 with a grade of "C" or better.

**ACCT5953 Assurance Services (FA)** The expression of assurance on financial statements and other forms of information for decision makers. Includes risk assessment, evidence gathering, and reporting. Prerequisite: ACCT 4753 and ACCT 4963 each with a grade of "C" or better.

**ACCT6011 Graduate Colloquium (FA, SP)** Presentation and critique of research papers and proposals.

**ACCT6033 Accounting Research Seminar I (FA)** First course in the accounting research seminar sequence that 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, behavioral accounting,

**ACCT6133 Accounting Research Seminar II (SP)** Second course in the accounting research seminar sequence that 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.

**ACCT6233 Accounting Research Seminar III (FA)** Third course in the accounting research seminar sequence that 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.

**ACCT636V Special Problems in Accounting (1-6) (FA, SP, SU)** Special research project under supervision of a graduate faculty member.

**ACCT6433 Accounting Research Seminar IV (SP)** Fourth course in the accounting research seminar sequence that 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.

**ACCT6633 Accounting Research Seminar V (FA, SP, SU)** Fifth course in the accounting research seminar sequence that 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.

**ACCT700V Doctoral Dissertation (1-6) (FA, SP, SU)** Prerequisite: candidacy.

## (ADED) ADULT EDUCATION

**ADED5103 Learner in Adult Education (FA, SP, SU)** The learner in adult education programs is examined from young adulthood to death. Emphasis is given to understanding the effect this knowledge has on the teaching-learning process in adult education and to how adult education programs are designed to serve the uniqueness demanded by adult learning situations.

**ADED5113 Adult Learner: The Later Years (FA, SP, SU)** Directed toward people who are most likely to interact with older adults in a learner setting. Emphasis is on understanding the educational needs, wants, and characteristics of older learners so that appealing, valuable, and efficient instruction can be developed.

**ADED5123 Nontraditional Student (FA, SP, SU)** An overview of activities that could ultimately promote greater access and success for adult learners with higher education.

**ADED5203 ABE/GED/ESL (FA, SP, SU)** An introductory course to teaching adults at the Adult Basic Education (ABE), General Education Development (GED-High School Equivalency), and English as a Second Language (ESL) levels. Will address instructional needs assessment, curriculum development and evaluation, and techniques of teaching basic skills in various settings including public schools, vocational-technical schools, technical institutes, technical colleges, community organizations, and the workplace.

**ADED5213 Teaching Reading to Adults (FA, SP, SU)** A practically-oriented course enabling the ABE/GED teacher to improve the reading program by developing skill in the identification of the reading difficulties of adult students and in the use of suitable strategies for helping these adults overcome their difficulties. Emphasis on diagnostic-prescriptive reading instruction and will include the following 3

main components: the adult as a learner; assessing reading needs in adult basic education; and developing reading skills for the adult learner.

**ADED5223 Teaching Disadvantaged Adults (FA, SP, SU)** A survey of the diversity of adult learners comprising that population described as educationally disadvantaged. Consideration given to the various physical, mental, social, and economic factors that contribute to the uniqueness of this body of individual differing abilities.

**ADED5303 Contemporary Issues in Adult Education (FA, SP, SU)** Examines issues of methodology, theories, materials, and programming currently emerging in the field of adult education. Discussion focus upon timely topics as they appear in the professional publications.

**ADED5313 The Change Process in Adult Education (FA)** Processes available for changing adult behavior in both formal and informal situations. Emphasis on adult educator's role as a change agent.

**ADED5323 Foundations of Adult Education (FA, SP, SU)** History of the adult education movement in America, characteristics, interests, abilities, and educational needs of adults; the role of the public school in adult education; methods and techniques of conducting adult classes.

**ADED560V Workshop (1-18) (FA, SP, SU)**

**ADED574V Internship (1-18) (FA, SP, SU)**

**ADED599V Seminar (1-18) (FA, SP, SU)**

**ADED700V Doctoral Dissertation (1-18) (FA, SP, SU)**

## (AERO) AIR FORCE ROTC

**AERO1011 The Foundations of the United States Air Force I (FA)** A survey course designed to introduce cadets to the United States Air Force and Air Force Reserve Officer Training Corps. Topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, and an introduction to communication skills. LLAB mandatory for cadets. Corequisite: AERO 1010L.

**AERO1010L Foundations of the Air Force Laboratory I (FA)** Study and practice of Air Force customs and courtesies, drill and ceremonies, and military commands. Also a study of the environment of an Air Force officer, and the areas of opportunity available to commissioned officers. Corequisite: AERO 1011.

**AERO1021 The Foundations of the United States Air Force II (SP)** A survey course designed to introduce cadets to the United States Air Force and Air Force Reserve Officer Training Corps. Topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, and an introduction to communication skills. LLAB mandatory for cadets. Corequisite: AERO 1020L.

**AERO1020L Foundations of the Air Force Laboratory II (SP)** Study and practice of Air Force customs and courtesies, drill and ceremonies, and military commands. Also a study of the environment of an Air Force officer, and the areas of opportunity available to commissioned officers. Corequisite: AERO 1021.

**AERO2011 The Evolution of Air and Space Power I (FA)** A historical survey of air and space power, from the first balloons and dirigibles to the space-age global positioning systems of the Persian Gulf War. Historical examples illustrate the development of Air Force capabilities and missions. Additional topics: Principles of War and Tenets of Air and Space Power. LLAB mandatory for cadets. Corequisite: AERO 2010L.

**AERO2010L Evolution of Air Power Laboratory I (FA)** Continued study and practice of Air Force customs and courtesies, drill and ceremonies, and military commands. Also a study of the environment of an Air Force officer, and the areas of opportunity available to commissioned officers. Corequisite: AERO 2011.

**AERO2021 The Evolution of Air Power II (SP)** A historical survey of air and space power, from the first balloons and dirigibles to the space-age global positioning systems of the Persian Gulf War. Historical examples illustrate the development of Air Force capabilities and missions. Additional topics: Principles of War and Tenets of Air and Space Power. LLAB mandatory for cadets. Corequisite: AERO 2020L.



**AERO2020L The Evolution of Air and Space**

**Power II Laboratory (SP)** Continued study and practice of Air Force customs and courtesies, drill and ceremonies, and military commands. Also a study of the environment of an Air Force officer, and the areas of opportunity available to commissioned officers. Corequisite: AERO 2021.

**AERO3013 Air Force Leadership Studies I (FA)** A study of leadership, management fundamentals, professional knowledge, Air Force personnel and evaluation systems, leadership ethics, and the communication skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations. Corequisite: AERO 3010L.

**AERO3010L Air Force Leadership Studies**

**Laboratory (FA)** Practice with leadership and management experiences, including the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also includes interviews, guidance, and information that will increase the understanding, motivation, and performance of other cadets. Corequisite: AERO 3013.

**AERO3023 Air Force Leadership Studies II (SP)** A study of leadership, management fundamentals, professional knowledge, Air Force personnel and evaluation systems, leadership ethics, and the communication skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations. Corequisite: AERO 3020L.

**AERO3020L The Evolution of Air and Space**

**Power Laboratory II (SP)** Practice with leadership and management experiences, including the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also includes interviews, guidance, and information that will increase the understanding, motivation, and performance of other cadets. Corequisite: AERO 3023.

**AERO4013 National Security Affairs and**

**Preparation for Active Duty I (FA)** Examines the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on the military as a profession, officership, military justice, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Communication skills are honed within this structure. Corequisite: AERO 4010L.

**AERO4010L Advanced Leadership Experiences**

**Laboratory I (FA)** Practice with leadership and management experiences, including the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also includes interviews, guidance, and information that will increase the understanding, motivation, and performance of other cadets. Corequisite: AERO 4013.

**AERO4023 National Security Affairs and**

**Preparation for Active Duty II (SP)** Examines the national security process, regional studies, advanced leadership ethics, and Air Force doctrine. Special topics of interest focus on the military as a profession, officership, military justice, civilian control of the military, preparation for active duty, and current issues affecting military professionalism. Communication skills are honed within this structure. Corequisite: AERO 4020L.

**AERO4020L Advanced Leadership Experiences**

**Laboratory II (SP)** Practice with leadership and management experiences, including the planning and controlling of military activities of the cadet corps, and the preparation and presentation of briefings and other oral and written communications. Also includes interviews, guidance, and information that will increase the understanding, motivation, and performance of other cadets. Corequisite: AERO 4023.

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## (AFLS) AGRICULTURAL, FOOD AND LIFE SCIENCES

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**AFLS1011 Freshman Orientation (IR)** Orientation to academic life at the University and orientation to the broad spectrum of modern agriculture. Lecture 2 days per week during the first 8 weeks of the semester.

**AFLS102VH Honors Special Topics for Freshmen (1-2) (IR)** Topics not covered in other courses or in-depth study of a particular topic. Used primarily with the program for Beginning Scholars and the Honors Program. Must be in

Honors program to register for this course.

**AFLS400VH Honors Thesis (1-6) (FA, SP)**

**AFLS401VH Honors Special Topics (1-3) (IR)** Studies of selected topics not covered in other courses. Must be in the Honors program to register for this course. May be repeated for 4 hours.

**AFLS4021 Internship for Ambassadors (FA, SP)**

Practical experience gained through group dynamics, communication, planning and implementing college wide activities. Must be selected as a college Ambassador before enrolling.

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## (AGEC)

### AGRICULTURAL ECONOMICS AND AGRIBUSINESS

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**AGEC1103 Principles of Agricultural**

**Microeconomics (FA, SP)** Introduction to agricultural economics, including a survey of the role and characteristics of agriculture businesses in our economic system. Basic economic concepts concerning price determination, profit maximization, and resource use are emphasized. The use of economic principles as applied to the production and marketing decisions made by managers of agricultural firms is demonstrated. Pre- or Corequisite: MATH 1203.

**AGEC2003 Introduction to Global Agricultural,**

**Food and Life Sciences (FA)** A cross-disciplinary approach focusing on global environmental resources, animal and crop production, food safety and nutrition, agricultural marketing and merchandising, trade, agricultural policies and culture. Topics also will include transportation, law and information systems in various geographic regions. Lecture 3 hours per week.

**AGEC2103 Principles of Agriculture Macroeco-**

**nomics (FA, SP)** Applications of economics principles to problems of agricultural production, distribution, and income; including a study of the interrelationship between agriculture and other segments of the economy; and the dynamic forces in the economy that affect agriculture. Pre- or Corequisite: MATH 1203.

**AGEC2303 Introduction to Agribusiness (FA, SP)**

Introduction to agribusiness issues as they relate to the food processing, wholesale and retail sectors of the agricultural industry. Coverage of methods and tools agribusiness managers use to evaluate business opportunities. Case studies serve to communicate concepts of product distribution, design, promotion and pricing in the development of a marketing plan. Prerequisite: AGECEC 1103 or ECON 2023.

**AGEC3303 Food and Agricultural Marketing (FA)**

Surveys consumer trends in food markets and the marketing activities of the food and fiber system. Emphasizes marketing concepts for both commodities and differentiated food products. Topics include applied consumer and price theory; marketing management; structure and performance of the food system; and current agricultural marketing topics. Prerequisite: MATH 1203 and (AGECEC 1103 or ECON 2023).

**AGEC3373 Futures and Options Markets (SP)**

Theory and mechanics of commodity futures and options markets including trading, margin, fees, etc. Price relationships between cash, futures and options. Fundamental and technical price analysis. Price risk management strategies for producers and users of agricultural commodity marketing plan. Speculative and hedging simulation exercises. Prerequisite: AGECEC 1103 or ECON 2023.

**AGEC3403 Farm Business Management (FA)**

Application of economic principles for the profitable organization and operation of the farm business. Focuses upon agricultural production management decision-making tools: optimal input/output decisions, budgeting techniques (enterprise, partial, whole-farm, cash flow), linear programming, balance sheet, income statement, investment analysis and risk management. Lecture 2 hours, laboratory 2 hours per week. ACCT 2013 and AGME 2903 or ISYS 1121L are recommended as prerequisites. Corequisite: AGECEC 3400L. Prerequisite: AGECEC 1103 or ECON 2023.

**AGEC3400L Farm Business Management**

**Laboratory (FA)** Corequisite: AGECEC 3403.

**AGEC3413 Principles of Environmental**

**Economics (FA)** An introductory, issues-oriented course in the economics of the environment. What is involved in society making decisions about environmental quality will be studied. Environmental issues important to the State of Arkansas and the United States will be emphasized. Prerequisite: AGECEC 1103 or ECON 2023.

**AGEC3503 Agricultural Law I (SP)** Examination of those areas of law especially applicable to agriculture. Fundamentals of contract law, torts law, and property law will accompany discussion of major areas of agricultural law; acquisition and disposal of farmland; farm tenancies; rights and limitations in the use and ownership of farmland; water law; environmental protection; protection of the productivity of agricultural land; and the law of sales and secured transactions in an agricultural context.

**AGEC400V Special Problems (1-6) (FA, SP, SU)**

Special studies and readings conducted under the direct supervision of staff members to satisfy the requirements of individual students. May be repeated for 6 hours.

**AGEC401V Internship in Agribusiness (1-6) (IR)**

A supervised practical work experience in an agribusiness firm or a governmental or industrial organization having direct impact on agriculture to gain professional competence and insight to employment opportunities. May be repeated for 8 hours. Prerequisite: junior standing.

**AGEC402V Special Topics (1-3) (IR)**

Studies of selected topics in agricultural economics not available in other courses. May be repeated.

**AGEC4113 Agricultural Prices and Forecasting**

**(SP)** 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. Prerequisite: AGECEC 1103 (or ECON 2023) and ISYS 2013 (or AGST 4023 or STAT 2023) and MATH 2053 or MATH 2053 C (or MATH 2043) and ISYS 1121L.

**AGEC4110L Agricultural Prices and Forecasting**

**Laboratory (SP)**

**AGEC4143 Agricultural Finance (FA)** 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. ACCT 2013 and ACCT 2023 are recommended. Prerequisite: AGECEC 1103 (or ECON 2023) and AGECEC 2103 (or ECON 2013).

**AGEC4163 Agricultural and Rural Development**

**(SU)** 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. Prerequisite: AGECEC 1103 (or ECON 2023).

**AGEC4303 Advanced Agricultural Marketing**

**Management (SP)** 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 role that demand analysis and consumer behavior play in market management. Prerequisite: AGECEC 2303 and AGECEC 3303.

**AGEC4313 Agricultural Business Management**

**(FA)** 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. Prerequisite: senior standing.

**AGEC4373 Advanced Price Risk Management**

**(SP)** Use of futures markets as risk shifting institutions. Students design and implement hedging and cross hedging strategies for grain farmers, country elevators, soybean crushers, poultry firms, etc. Spreadsheets and statistical techniques are used to develop optimal hedging ratios. Prerequisite: AGECEC 3373.

**AGEC4403 Advanced Farm Business Manage-**

**ment (SP)** 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. Prerequisite: AGECEC 3403 and AGME 2903 (or ISYS 1121L).

**AGEC4413 Economics of Environmental**

**Management (SP)** 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. (Same as ENSC 4413) Prerequisite: AGECEC 1103 and AGECEC 3413.

**AGEC4613 Domestic and International Agricultural Policy (FA)** Agricultural and food policies studied from domestic and international perspectives. Examines public policy in terms of rationale, content, and consequences. Economic framework used to assess policies to improve competitive structure, operation, and performance of U.S. and international food and agriculture. Farm, international trade, resource, technology, food marketing, and consumer policies analyzed. Prerequisite: (AGEC 1103 or ECON 2023) and (AGEC 2103 or ECON 2013).

**AGEC500V Special Problems (1-3) (FA, SP, SU)** 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.

**AGEC5011 Seminar (FA, SP)** 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.

**AGEC502V Special Topics (1-3) (IR)** Advanced studies of selected topics in agricultural economics not available in other courses. May be repeated. Prerequisite: graduate standing.

**AGEC503V Internship in Agricultural Economics (1-6) (IR)** On-the-job application of skills developed in the M.S. program (credit/non-credit only).

**AGEC5113 Agricultural Marketing Analysis (SU)** Course prepares students for some of the more common tasks in market analysis as undertaken by professional agricultural economists in industry, government, and academic institutions. Major emphasis is on the analytical procedures and techniques required in short- and long-term outlook work; forecasting and projecting supply, demand and prices; and optimal market organization. Prerequisite: AGECEC 5303.

**AGEC5143 Financial Management in Agriculture (IR)** 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.

**AGEC5153 The Economics of Agricultural Policy (SP)** Application of welfare criteria and economic analyses to the problems and policies affecting resource adjustments in agriculture. Existing programs and alternative proposals are evaluated for both short and long term viewpoints, under the criterion of resource use and income distribution within agriculture or between agriculture and the rest of the economy. Prerequisite: graduate standing.

**AGEC5303 Agricultural Marketing Theory (SP)** 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.

**AGEC5403 Quantitative Methods for Agribusiness (FA)** 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.

**AGEC5413 Agribusiness Strategy (FA)** 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.

**AGEC5613 Econometrics I (FA)** 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. An introduction to the simultaneous systems model is presented. Two 80-minute lecture periods weekly. (Same as ECON 5613) Prerequisite: MATH 2043 and knowledge of matrix methods, which may be acquired as a corequisite and (AGEC 1103 or ECON 2023) and an introductory statistics course.

**AGEC5623 Econometrics II (SP)** Use of economic theory and statistical methods to estimate simultaneous equation models of an economy. Emphasis given to the problem of identification and the methods of estimating system models. Frontier topics are introduced. (Same as ECON 5623) Prerequisite: ECON 5533 and ECON 5613 (or AGECEC 5613).

**AGEC600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**AGEC700V Doctoral Dissertation (1-6) (FA, SP, SU)** Prerequisite: candidacy.

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## (AGED) AGRICULTURAL EDUCATION

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**AGED1001 Orientation to Agricultural and Extension Education (FA)** Continuation of AGAD 1001, Freshman Orientation, with attention given to sharing of possible solutions to individual problems. Exploration of anticipated collegiate experiences for departmental majors as well as post-graduation opportunities. Student and faculty interaction is stressed. The class meets during the last half of the fall semester twice a week. The class also meets 1 or 2 evenings for up to two hours each time.

**AGED102V Special Topics for Freshmen (1-2) (IR)** Topics not covered in other courses or in-depth study of a particular topic. Used primarily with the program for Beginning Scholars and the Honors Program.

**AGED1031 Introduction to Early Field Experience (FA)** A thirty hour field experience designed to give prospective agricultural education teachers an opportunity to observe and participate in a variety of school settings. Corequisite: CIED 1002.

**AGED1122 Agricultural Youth Organizations (FA)** Survey course of agricultural youth organizations including 4-H, FFA, Grange, and others pertaining to membership, awards programs, benefits, and special recognition programs. Lecture and discussion. Two periods per week.

**AGED3133 Methods in Agricultural Education (IR)** Methods and techniques in teaching agriculture at the secondary level. Lecture 2 hours, laboratory 2 hours per week. Corequisite: AGED 3130L. Prerequisite: CIED 1002 and CIED 1011.

**AGED3130L Methods in Agricultural Education Laboratory (IR)** Must be taken at the same time as AGED 3133 to receive credit. Corequisite: AGED 3133.

**AGED3142 Agri Communications (FA, SP)** An overview of communications in the agricultural, food and life sciences, including newsletter design, slide presentations, newswriting, electronic communication and web publishing. Corequisite: AGED 3141L.

**AGED3141L Ag Communications Lab (FA, SP)** Corequisite: AGED 3142.

**AGED3153 Leadership Development in Agriculture (FA, SP)** Identification of styles and roles of leadership; development of leadership techniques and skills required in working with organizations; dynamics of group action; methods of resolving conflict; ethical considerations for leaders; and personal skills development. Prerequisite: junior standing.

**AGED4003 Issues in Agriculture (FA, SP)** Lecture and discussion on local, regional, national and international issues related to agricultural policy, ethics, environment, society, and science. Designed for students with at least six hours of upper division agricultural science courses. Prerequisite: senior standing.

**AGED400V Special Problems in Agricultural and Extension Education (1-6) (FA, SP, SU)** Individual study or research for advanced undergraduates in the field of agriculture and extension education.

**AGED4012 Program Development (FA)** Principles and concepts of leadership, program organization, supervised agricultural experience, and advisory committees. This course is a portion of pre-professional studies required for certification in agricultural education. Prerequisite: AGED 3133.

**AGED401V Special Topics (1-3) (IR)** Studies of selected topics in agricultural or extension education not covered in other courses. May be repeated for 4 hours.

**AGED4143 Electronic Communications in Agriculture (SP)** An overview of communication technology in the agricultural, food and life sciences. Prerequisite: AGED 3142 and AGED 3141L.

**AGED4843 Methods in Agricultural Laboratories (SP)** Methods and management techniques in all types of agricultural laboratories that may be in a secondary agricultural science program. Emphasis on management of students and facilities, equipment, and materials. Lecture 2 hours, laboratory 4 hours per week. Prerequisite: AGME 2123.

**AGED5001 Seminar (SP)** 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.

**AGED5013 Advanced Methods in Agricultural Mechanics (IR)** Emphasis on shop organization and management, courses of study, unit shop instruction, and development of skills in agricultural mechanics.

**AGED5033 Developing Leadership in Agricultural Organizations (IR)** Organizational concepts of leadership; administrative styles and structures; leadership for boards, committees, governmental bodies, and review of societal and political processes. Prerequisite: graduate standing.

**AGED5031 Ethics in Agricultural and Extension Education (FA)** A study of ethics as applied to problems of professional practice. The focus will be on case studies.

**AGED5053 Philosophy of Agricultural and Extension Education (IR)** 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.

**AGED5074 Program Management Practicum (SP)** A course involving activities emphasizing the practical application of theory and on-the-job experiences in program management. Corequisite: AGED 575. Prerequisite: admission into the MAT program.

**AGED510V Special Problems (1-6) (FA, SP, SU)** Individual investigation of a special problem in agricultural education that is not available through regular courses. These will be directed by a member of the graduate faculty. Prerequisite: graduate standing.

**AGED520V Special Topics in Agricultural and Extension Education (1-4) (IR)** Topics not covered in other courses or a more intensive study of specific topics in agriculture education. May be repeated. Prerequisite: graduate standing.

**AGED5463 Research Methodology in the Social Sciences (SP, Odd years)** 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. (Same as AGECEC 5013, HESCEC 5463) Prerequisite: graduate standing.

**AGED5473 Interpreting Social Data in Agriculture (FA)** 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. Prerequisite: AGST 4023 (or EDFD 5393) and AGED 5463 (or RSOC 5463 or HESCEC 5463 or AGED 5013).

**AGED550V College Teaching in Agriculture and Related Disciplines (1-3) (IR)** For students who are pursuing graduate degrees where emphasis is on preparation for a research career, but who also may desire or expect to teach. Provides theory and practice in planning and executing a college-level course.

**AGED575V Internship in Agricultural Education (1-6) (FA, SP)** Scheduled practical field experiences under supervision of a professional practitioner in off-campus secondary school systems. Emphasis includes classroom preparation, teaching, and student evaluation.

**AGED600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.



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## (AGME) AGRICULTURAL MECHANICS

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**AGME1613 Fundamentals of Agricultural Systems Technology (SP)** Introduction to basic physical concepts important in agricultural technical systems: applied mechanics, power and machinery management, structures and electrification, and soil and water conservation. Lecture 3 hours per week. Prerequisite: MATH 1203.

**AGME1611L Fundamentals of Agricultural Systems Technology Laboratory (SP)** Study of basic mathematical and physical science concepts important in the mechanization of agriculture. Laboratory required for agricultural education, communication and technology majors enrolled in AGME 1613, optional for others enrolled in AGME 1613. Corequisite: AGED 1613. Prerequisite: MATH 1203.

**AGME2123 Metals and Welding (FA)** An introduction to agricultural mechanics shop work to include hot and cold metal work, arc welding, and gas welding and cutting. Lecture 2 hours, laboratory 3 hours per week. Corequisite: AGME 2120L.

**AGME2120L Metals and Welding Laboratory (FA)** Must be taken at the same time as AGME 2124 to receive degree credit. Corequisite: AGME 2123.

**AGME2903 Agricultural and Human Environmental Sciences Applications of Microcomputers (FA, SP, SU)** Lecture and laboratory assignments covering the contemporary use of microcomputers in agricultural research, production, and home economics. Major emphasis placed on learning to use selected, appropriate software packages. Lecture 2 hours per week, laboratory 2 hours per week.

**AGME3102 Small Power Units/Turf Equipment (SP)** Principles of operation, adjustment, repair, maintenance, and trouble shooting of small air-cooled engines and power units, including various engine systems, service and maintenance of turf equipment and machinery. Lecture 2 hours per week. Corequisite: AGME 3101L. Prerequisite: MATH 1203.

**AGME3101L Small Power Units/Turf Equipment Laboratory (SP)** Testing, evaluation, and maintenance of engines, hydrostatic power transmission systems, and equipment commonly used in the turf and landscaping industries. Corequisite: AGME 3102. Prerequisite: MATH 1203.

**AGME3153 Surveying in Agriculture and Forestry (FA)** (Formerly AGME 2153) Techniques and procedures normally used in determining areas and characterizing the topography of agricultural and forest lands. Includes basic concepts of surveying; use and care of level, transit, distance measuring equipment; topographic mapping and public land surveys. Lecture and laboratory 6 hours per week. Prerequisite: MATH 1203.

**AGME3173 Electricity in Agriculture (FA)** Principles of electricity; wiring of home, farmstead and other agricultural structures; selection of electric motors and their care and application in the broad field of agriculture; lighting and special uses of electricity such as heating and electrical controls. Lecture 2 hours, laboratory 2 hours per week. Corequisite: AGME 3170L.

**AGME3170L Electricity in Agriculture Laboratory (FA)** Corequisite: AGME 3173.

**AGME400V Special Problems (1-6) (FA)** Individual research or study in electrification, irrigation, farm power, machinery, or buildings. May be repeated. Prerequisite: senior standing.

**AGME4011 Senior Seminar (IR)** For agricultural education, communication and technology majors. Covers how to prepare and present a report on a current topic, job opportunities, and professionalism. Prerequisite: senior standing.

**AGME402V Special Topics in Agricultural Mechanization (1-4) (IR)** Topics not covered in other courses or a more intensive study of special topics in agricultural mechanization. May be repeated.

**AGME4203 Mechanized Systems Management (FA, SP, SU)** Selection, sizing, and operating principles of agricultural machinery systems, including power sources. Cost analysis and computer techniques applied to planning and management of mechanized systems. Corequisite: AGME 4200L. Prerequisite: MATH 1203 (or AGME 2903).

**AGME4200L Mechanized Systems Management Laboratory (FA, SP, SU)** Corequisite: AGME 4203.

**AGME4963 Soil and Water Conservation Technology (SP, Even years)** Management and conservation of soil and water resources in agriculture. Analysis of the nature of natural resources in agriculture and problems arising from their abuse. Analytical solution of soil and water management problems including estimating runoff and erosion and effective control. Recitation 2 hours per week, laboratory 3 hours per week. Prerequisite: AGME 1613.

**AGME4960L Soil and Water Conservation Technology Laboratory (FA, Even years)** Corequisite: AGME 4963.

**AGME4973 Irrigation (SP, Odd years)** Methods of applying supplemental water to soils to supply moisture essential for plant growth, sources of water, measurement of irrigation water, pumps, conveyance structure, economics, and irrigation for special crops. Lecture 2 hours, laboratory 3 hours per week. Corequisite: AGME 4970L. Prerequisite: MATH 1203.

**AGME4970L Irrigation Laboratory (SP, Odd years)** Corequisite: AGME 4973.

**AGME4983 Agricultural Meteorology (FA, Even years)** Meteorological phenomena, their observation and measurements and their interaction with agricultural biological systems. Lecture 3 hours per week. Prerequisite: MATH 1203.

**AGME5014 Experiment Station Operations I (IR)** Planning and design of experiment stations; general, personnel, fiscal, and communications administration on an experiment station. Lecture 3 hours, laboratory 3 hours per week. Corequisite: AGME 5010L.

**AGME5010L Experiment Station Operations I Laboratory (IR)** Corequisite: AGME 5014.

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## (AGST) AGRICULTURAL STATISTICS

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**AGST400V Special Problems (1-6) (FA, SP)** Work on special problems of agricultural statistics or related areas.

**AGST4011 SAS Programming for Agricultural Sciences (FA, SP)** 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.

**AGST4023 Principles of Experimentation (FA, SP)** Fundamental concepts of experimental and statistical methods as applied to agricultural research. Lecture 3 hours per week. Prerequisite: MATH 1203 or higher level.

**AGST500V Special Problems (1-6) (FA, SP, SU)** 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. May be repeated for 6 hours.

**AGST5014 Experimental Design (SP)** Types of experimental designs, their analysis and application to agricultural research. Lecture 3 hours and laboratory 2 hours per week. Corequisite: AGST 5010L. Prerequisite: AGST 4011 and (AGST 4023 or STAT 4003).

**AGST5010L Experimental Design Laboratory (SP)** Corequisite: AGST 5014.

**AGST504V Special Topics (1-4) (IR)** Topics not covered in other courses or a broader-based study of specific topics in statistics and related areas. May be repeated. Prerequisite: graduate standing.

**AGST5713 Applied Regression Analysis for Agricultural Sciences (FA)** Analysis of agricultural experiments that contain quantitative factors through regression procedures. Lecture 3 hours per week. Prerequisite: AGST 4011 and (AGST 4023 or STAT 4003).

**AGST5803 Case Studies in Biometry (SP)** Non-standard statistical problems arising in the agricultural, food, environmental, and life sciences. Prerequisite: STAT 5113 and STAT 5313 and either (AGST 5014 and AGST 5010L) or STAT 4373.

**AGST5901 Statistical Consulting Process (SP)** Examines the components of statistical consulting with emphasis on the interpersonal aspects.

**AGST5913 Statistical Consulting Practicum (FA)** Supervised statistical consulting. Prerequisite: STAT 5313 and AGST 5901 and either (AGST 5014 or STAT 4373).

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## (AIST) ASIAN STUDIES

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**AIST4003 Asian Studies Colloquium (FA)** An interdepartmental colloquium with an annual change of subject, required of students in the Asian studies program. May be repeated for 6 hours. Prerequisite: sophomore standing.

**AIST4313 Language and Society of Japan (FA)** The primary objective of this course is to investigate the way the Japanese language reflects the beliefs and customs 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. May be repeated for 6 hours. Prerequisite: junior standing.

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## (AMST) AMERICAN STUDIES

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**AMST2003 Introduction to American Studies (FA)** Introduction to American Studies as an interdisciplinary field of study. Examination of a selected topic from various methodological perspectives.

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## (ANSC) ANIMAL SCIENCES

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**ANSC1001L Introductory to Animal Sciences Laboratory (FA)** Study of facilities used in production, processing, and management in animal agriculture. Identification, selection evaluation and testing of livestock, meat, and milk. Laboratory 3 hours per week.

**ANSC1032 Introductory Animal Sciences (FA)** Students will be introduced to biological sciences associated with modern systems of care and management of livestock. Foundation sciences include topics in genetics, growth and development, physiology, nutrition, animal health, and animal behavior. Course will meet M, T, W, and R for the first eight weeks of the fall semester.

**ANSC1041 Introduction to Companion Animal Industry (FA)** The importance of companion animals and their allied industries will be discussed. Application of scientific principles to the care and management of companion animals, specifically dogs, cats and horses, will be emphasized. Course will meet on T and R during the second eight weeks of the fall semester. Prerequisite: ANSC 1032.

**ANSC1051 Introduction to the Livestock Industry (FA)** The importance of livestock and their allied industries will be discussed. Application of scientific principles to the care and management of livestock, specifically beef and dairy cattle, swine, sheep, and goats will be emphasized. Course will meet on M and W during the second eight weeks. Prerequisite: ANSC 1032.

**ANSC2003 Introduction to Equine Industry (SP)** Examination of careers and business opportunities in the equine industry. Students will gain the opportunity to identify high quality horses through evaluation of conformation and locomotion. Students will also gain skill at oral presentation and be knowledgeable of costs and responsibilities associated with horse ownership.

**ANSC2213 Behavior of Domestic Animals (FA)** Behavior associated with domestication. Effects of selective breeding, physical and social environments, and developmental stage on social organization, aggressive behavior, sexual behavior, productivity, and training of domestic animals.

**ANSC2252L Introduction to Livestock and Meat Evaluation (SP)** Develop an understanding between live animal evaluation and carcass composition. Comparative judging including meat evaluation, classification and selection of beef cattle, sheep and swine. Prerequisite: ANSC 1032.

**ANSC2303 Equine Behavior and Training (FA)** Psychology and ethology of equine social behavior and how it pertains to learning patterns. Application of fundamental behavioral concepts to training of horses. Students will apply classical, practical, and proven equine training techniques to achieve safe less-traumatic learning for the horse and trainer. Lecture two hours and laboratory six hours per week.

**ANSC2300L Equine Behavior and Training Laboratory (FA)**

**ANSC2482 Introduction to Companion Animal Management (FA)** Principles of companion animal management, primarily dogs and cats. Lectures and demonstrations will address husbandry, behavior, nutrition, health, reproduction and selection of dogs and cats as companions.

**ANSC2781 Career Preparation and Development**

(FA) The importance of preparing for a career in the animal sciences and industries will be covered.

**ANSC3003 Applied Animal Parasitology**

(FA) The economically important parasites of domestic animals with emphasis on their host relationships and management considerations. Lecture 2 hours, laboratory 2 hours per week. Corequisite: ANSC 3000L. Prerequisite: ANSC 1032.

**ANSC3000L Applied Animal Parasitology**

**Laboratory** (FA) Corequisite: ANSC 3003.

**ANSC3013 Parasitisms of Domesticated Non-Herbivores**

(SP) Course will provide applied instruction and appreciation for the parasitisms of our domesticated swine, chickens, turkeys, dogs and cats. Prerequisite: ANSC 3003.

**ANSC3032 Animal Physiology I** (FA) Fundamental aspects of neural/muscle/bone tissues and the cardiovascular system, the normal structure and functions of these systems will be emphasized. Lecture 2 hours per week. (Same as POSC 3032) Prerequisite: BIOL 1543 and CHEM 1123 or CHEM 1074.

**ANSC3042 Animal Physiology II** (SP) Fundamental aspects of renal, respiratory, digestive, and endocrine physiology will be covered. The normal structure and function of these systems will be emphasized. Lecture 2 hours per week. (Same as POSC 3042) Prerequisite: ANSC 3032 or POSC 3032.

**ANSC3123 Principles of Genetics** (FA) Fundamentals of heredity, with special emphasis on the improvement of farm animals. Lecture 3 hours per week. (Same as POSC 3123) Prerequisite: BIOL 1543 and BIOL 1541L and MATH 1203.

**ANSC3133 Animal Breeding and Genetics**

(SP) Application of the principles of genetics to the breeding of farm animals. Lecture 3 hours per week. Prerequisite: ANSC 1032.

**ANSC3143 Principles of Animal Nutrition**

(SP) Scientific approach to animal nutrition involving the mechanisms through which feed nutrients are utilized by farm animals. Lecture 3 hours per week. Prerequisite: CHEM 1074 and CHEM 1071L.

**ANSC3152 Applied Animal Nutrition** (FA) Practical approach to animal nutrition; physical and chemical composition of feedstuffs, feed processing and preparation, nutrient interactions, and application of nutritional principles to feeding domestic animals. Lecture 2 hours per week. Corequisite: ANSC 3151L. Prerequisite: ANSC 3143.

**ANSC3151L Applied Animal Nutrition Laboratory**

(FA) Practical approach to animal nutrition; use of various methods of feedstuff evaluation and ration balancing for domestic animals. Laboratory 2 hours per week. Corequisite: ANSC 3152. Prerequisite: ANSC 3143 and MATH 1203.

**ANSC3282 Livestock Judging and Selection**

(FA) Comparative judging, including grading, classification, and selection of beef cattle, swine, sheep and horses. Oral and written discussion. Laboratory 6 hours per week. Prerequisite: ANSC 1032 or ANSC 2252L.

**ANSC3291 Livestock Junior Judging Team**

**Activity** (SP) Training for membership on judging teams, through participation.

**ANSC3333 Diseases of Livestock** (SP) Introductory study of the diseases of farm animals with emphasis on fundamental principles of disease, body defense mechanisms, hygiene, and sanitation. Corequisite: ANSC 3330L. Prerequisite: ANSC 3032 and ANSC 3042 and MBIO 2013 and MBIO 2011L.

**ANSC3330L Diseases of Livestock Laboratory**

(SP) Corequisite: ANSC 3333.

**ANSC3433 Fundamentals of Reproductive**

**Physiology** (FA) Principles of mammalian reproductive physiology with emphasis on farm animals. Lecture 3 hours per week. Prerequisite: ANSC 1003 and BIOL 1543.

**ANSC3491 Artificial Insemination of Cattle and Swine**

(SP) Experience in artificial insemination of cattle and swine, including semen handling, estrus synchronization and detection, and insemination technique. Laboratory 4 hours per week for 8 weeks. The course is offered the second 8 weeks of the Spring semester. Prerequisite: ANSC 3433.

**ANSC3613 Meat Science** (FA) The study of meat science and muscle biology. Topics will include animal/tissue growth and development and the relationship to meat quality. Meat processing, preservation, and meat safety concerns will also be considered. Lecture 3 hours per week. Prerequisite: CHEM 2613 or CHEM 3603.

**ANSC3691 Meats Judging** (SP) Training in judging meat based on federal grading standards. Laboratory 4 hours per week. Prerequisite: ANSC 3614.

**ANSC3722 Seedstock and Horse Merchandising**

(FA) Various types of merchandising programs for specific livestock enterprises will be presented. Students will evaluate the effectiveness of merchandising programs including how to organize, advertise, and manage a purebred auction sale of livestock. Prerequisite: AGECE 2303.

**ANSC400V Special Problems (1-6)**

(FA, SP, SU) Special problems in the animal sciences for advanced undergraduate students.

**ANSC401V Internship in Animal Sciences (1-6)**

(FA, SP, SU) Supervised work experience with private or government organizations May be repeated for 6 hours. Prerequisite: junior standing.

**ANSC410V Special Topics in Animal Sciences (1-4)**

(IR) Topics not covered in other courses or a more intensive study of specific topics in animal sciences. May be repeated. Prerequisite: ANSC 1003.

**ANSC4252 Cow-Calf Management**

(FA) 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. Lecture 1 hour and laboratory 2 hours per week. Prerequisite: ANSC 1003 and ANSC 2143 and ANSC 3133 and ANSC 3433.

**ANSC4263 Swine Production**

(FA) Methods in producing purebred and commercial swine with specific emphasis on the management programs needed for profitable pork production in Arkansas. Lecture 2 hours, laboratory 3 hours per week. Corequisite: ANSC 4260L. Prerequisite: ANSC 1003 and ANSC 2143 and ANSC 3123.

**ANSC4260L Swine Production Laboratory**

(FA) Corequisite: ANSC 4263.

**ANSC4272 Sheep Production**

(SP, Odd years) Purebred and commercial sheep management emphasizing the programs of major importance in lamb and wool production in Arkansas. Lecture 1 hour, laboratory 2 hours per week. Corequisite: ANSC 4270L. Prerequisite: ANSC 1003 and ANSC 2143 and ANSC 3123.

**ANSC4283 Horse Production**

(SP) Production, use and care of horses and ponies including breeding, feeding, handling, and management. Lecture 2 hours, laboratory 3 hours per week. Corequisite: ANSC 4280L. Prerequisite: ANSC 1003 and ANSC 2143 and ANSC 3123.

**ANSC4280L Horse Production Laboratory**

(SP) Corequisite: ANSC 4283.

**ANSC4291 Livestock Senior Judging Team**

**Activity** (FA) Training for membership on judging teams, through participation.

**ANSC4452 Milk Production**

(SP) Principles of breeding, feeding, and management of dairy cattle will be reviewed, and course will include field trip touring dairy industry. Lecture one hour per week and laboratory two hours per week. Prerequisite: ANSC 1003 and ANSC 2143.

**ANSC4652 Stocker-Feedlot Cattle Management**

(FA) 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. Lecture one hour per week and laboratory two hours per week. Prerequisite: ANSC 1003 and ANSC 2143 and senior standing.

**ANSC500V Special Problems (1-6)**

(FA, SP, SU) Work in special problems of animal industry.

**ANSC5013 Domestic Animal Energetics**

(SP, Odd years) 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.

**ANSC510V Special Topics in Animal Sciences (1-4)**

(IR) Topics not covered in other courses or a more intensive study of specific topics in animal sciences. May be repeated. Prerequisite: graduate standing.

**ANSC5123 Advanced Animal Genetics**

(FA, Even years) Specialized study of animal genetics. Lecture 3 hours per week. (Same as POSC 5123) Prerequisite: ANSC 3123.

**ANSC5133 Quantitative Inheritance**

(SP, Odd years) Advanced study of the genetic basis of variation and the genetic control of quantitative traits in populations. Lecture 3 hours per week. Prerequisite: ANSC 3133.

**ANSC5143 Biochemical Nutrition**

(FA, Even years) 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. (Same as POSC 5143) Prerequisite: CHEM 3813.

**ANSC5152 Protein and Amino Acid Nutrition**

(SP, Even years) 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.

**ANSC5253 Advanced Livestock Production**

(FA, Even years) Comprehensive review of recent advances in research relative to the various phases of livestock production. Prerequisite: ANSC 4252 (or ANSC 4263) and ANSC 3133 (or ANSC 3143).

**ANSC5353 Advanced Hay and Silage Production**

(FA) Advanced study of the principles of good hay and silage production. The course includes a detailed review of forage nutritive value followed by an in-depth discussion of the management of wilting forage crops, silage biochemistry, ensiling characteristics of various forages, silo management, spontaneous heating in hay and silage, dry matter loss, management of stored hay, and changes in forage quality that result from poor conservation of harvested forages. Prerequisite: CSES 3113 and ANSC 3152 and ANSC 3151L.

**ANSC5743L Advanced Analytical Methods in**

**Animal Sciences Laboratory** (FA) Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. Prerequisite: CHEM 3813 (or equivalent) and PHYS 2013 and PHYS 2011L and ANSC 4743 (or POSC 4743 or equivalent).

**ANSC5853 Advanced Meats Technology**

(SU, Odd years) 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 (Same as POSC 5853) Prerequisite: POSC 4314 or ANSC 3613.

**ANSC5901 Seminar**

(FA, SP, SU) Critical review of the current scientific literature pertaining to the field of animal science. Oral reports. Lecture 1 hour per week. Prerequisite: senior standing.

**ANSC5922 Neurophysiology**

(FA) Neurophysiology, including mechanisms of nerve conduction, understanding of central integration and processing of signals with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (or first 8 weeks of semester). (Same as POSC 5922) Pre- or Corequisite: CHEM 3813. Corequisite: ANSC 5920D. Prerequisite: POSC/ANSC 3032 and POSC/ANSC 3042.

**ANSC5920D Neurophysiology Drill**

(FA) Corequisite: ANSC 5922.

**ANSC5933 Environmental Physiology of**

**Domestic Animals** (FA, Odd years) Study of the environment of domestic animals and its effect on physiological systems that affect maintenance, growth, production, and reproduction. Lecture 3 hours per week. (Same as POSC 5933) Prerequisite: ANSC 3032 (or POSC 3032) and CHEM 3813 (or equivalent).

**ANSC5932 Cardiovascular Physiology of**

**Domestic Animals** (FA) 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). (Same as POSC 5932) Pre- or Corequisite: CHEM 3813. Corequisite: ANSC 5930D. Prerequisite: POSC/ANSC 3032 and POSC/ANSC 3042.

**ANSC5930D Cardiovascular Physiology of**

**Domestic Animals Drill** (FA) Corequisite: ANSC 5932.

**ANSC5942 Endocrine Physiology of Domestic**

**Animals** (FA) 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). (Same as POSC 5942) Pre- or Corequisite: CHEM 3813. Corequisite: ANSC 5940D. Prerequisite: POSC/ANSC 3032 and POSC/ANSC 3042.

**ANSC5940D Endocrine Physiology of Domestic**

**Animals Drill** (FA) Corequisite: ANSC 5942.

**ANSC5952 Respiratory Physiology of Domestic**

**Animals** (SP) Respiratory physiology, including mecha-



nisms 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. (Same as POSC 5952) Pre- or Corequisite: CHEM 3813. Corequisite: ANSC 5950D. Prerequisite: POSC/ANSC 3032 and POSC/ANSC 3042.

**ANSC5950D Respiratory Physiology of Domestic Animals Drill (SP)** Corequisite: ANSC 5952.

**ANSC5962 Gastrointestinal/Digestive Physiology of Domestic Animals (SP)** 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). (Same as POSC 5962) Pre- or Corequisite: CHEM 3813. Corequisite: ANSC 5960D. Prerequisite: POSC/ANSC 3032 and POSC/ANSC 3042.

**ANSC5960D Gastrointestinal/Digestive Physiology of Domestic Animals Drill (SP)** Corequisite: ANSC 5962.

**ANSC5972 Renal Physiology (SP)** 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). (Same as POSC 5972) Pre- or Corequisite: CHEM 3813. Corequisite: ANSC 5970D. Prerequisite: POSC/ANSC 3032 and POSC/ANSC 3042.

**ANSC5970D Renal Physiology Drill (SP)** Corequisite: ANSC 5972.

**ANSC600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**ANSC6143 Minerals in Animal Nutrition (SP, Odd years)** Mineral nutrients, their sources and functions, as related to nutrition of domestic animals. Lecture 3 hours per week. Prerequisite: ANSC 3143 or POSC 4343.

**ANSC6243 Ruminant Nutrition (FA, Odd years)** 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.

**ANSC6253 Forage-Ruminant Relations (SP, Odd years)** 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. (Same as CSES 6253) Prerequisite: ANSC 3143 and CSES 3113.

**ANSC6343 Vitamin Nutrition in Domestic Animals (SP, Even years)** 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. (Same as POSC 6343) Prerequisite: ANSC 4143 (or POSC 4343) and CHEM 3813.

**ANSC6833 Reproduction in Domestic Animals (SP, Even years)** Comprehensive review of current theory of reproductive function in domestic animals. Lecture 3 hours per week. (Same as POSC 6833) Prerequisite: ANSC 3433.

**ANSC700V Doctoral Dissertation (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

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## (ANTH) ANTHROPOLOGY

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**ANTH0003 Peoples of the World (FA)** Cultures of the world are studied from the double perspective of levels of sociocultural complexity (bands, tribes, chiefdoms, states) and major world culture areas. This course is designed for freshmen assigned a course deficiency in the social sciences and credit earned in this course may not be applied to the total required for a degree.

**ANTH1013 Introduction to Biological Anthropology (FA)** An introduction to the field of physical anthropology using human evolution as a unifying concept. Areas include human genetics, race, speciation, primate evolution, and human variation and adaptation. Co- or Prerequisite: ANTH 1011L or ANTH 1011M.

**ANTH1011L Introduction to Biological Anthropology Laboratory (FA)** Laboratory exercises illustrating concepts of physical anthropology. Corequisite: ANTH 1013.

**ANTH1011M Honors Introduction to Biological Anthropology Laboratory (FA)** Laboratory exercises

illustrating concepts of physical anthropology. Corequisite: ANTH 1013.

**ANTH1023 Introduction to Cultural Anthropology (FA, SP, SU)** Introduction to the nature of culture and its influence on human behavior and personality: comparative study of custom, social organization, and processes of change and integration of culture.

**ANTH1023H Honors Introduction to Cultural Anthropology (FA)** Introduction to the nature of culture and its influence on human behavior and personality; comparative study of custom, social organization, and processes of change and integration of culture.

**ANTH3003 World Prehistory (IR)** Survey of the prehistoric and early historic cultures of the Americas, Asia, and Africa.

**ANTH3023 Approaches to Archeology (FA, SP)** Study of the field of archeology including method, theory, analysis and interpretation with substantive worldwide examples.

**ANTH3021L Archeology Laboratory (FA, SP)** Laboratory exercises illustrating concepts of archeology. Corequisite: ANTH 3023.

**ANTH3123 The Anthropology of Religion (SP)** An exploration of rituals, symbols, and rules that shape religious life. Religion is viewed broadly, considering activities that invoke powers beyond the reach of ordinary senses. Examining a variety of cultures, we explore what people say and do as they participate in activities such as magic, healing, pilgrimage, and contemporary religious movements.

**ANTH3153 The Evolution of Human Nature (FA)** Human nature consists of infinite variations upon a theme shaped by evolutionary forces. This course is a cross-species and cross-cultural exploration of the origins and many variations of our unique patterns of culture, language, sex, marriage, parenting, childhood, aging, subsistence, sociality, competition, warfare and generosity. Pre- or Corequisite: ANTH 1013.

**ANTH3163 Male and Female: A Cultural and Biological Overview (FA)** A comparative study of male and female roles in culture in relation to human biology and socialization.

**ANTH3173 Introduction to Linguistics (SP)** Introduction to language study with stress upon modern linguistic theory and analysis. Data drawn from various languages reveal linguistic universals as well as phonological, syntactic, and semantic systems of individual languages. Related topics: language history, dialectology, language and its relation to culture and society, the history of linguistic scholarship. (Same as COMM 3173, ENGL 3173) Prerequisite: junior standing.

**ANTH3203 American Indians Today (IR)** Study of contemporary Native Americans of North America; reservation and non-reservation life; social problems; social movements.

**ANTH3213 Indians of North America (SP)** Study of the Indians of North America and Mexico emphasizing lifeways at early White contact and subsequent acculturation.

**ANTH3233 Prehistoric Peoples and Cultures of Mexico and Central America (IR)** Study of the Indians of Middle America (Mexico to Honduras) from earliest prehistoric times to the colonial period, covering their culture history, and the basic facts of material and social cultures.

**ANTH3253 Cultures of the South (SP)** Survey of the diverse ethnic and racial groups of the American South with special emphasis on social and cultural traits related to contemporary developments. (Same as SOCI 3253)

**ANTH3263 Indians of Arkansas and the South (FA)** Study of the traditional lifeways and prehistoric backgrounds of Indians living in the Southern United States, including Arkansas.

**ANTH3333 Anthropology of Ethnicity (FA)** Anthropological approaches to the study of race and ethnicity, with reference to other models such as gender, nation, and class. Case studies drawn from Western and non-Western societies, and from pre-colonial and post colonial periods. (Same as SOCI 3333)

**ANTH3423 Human Osteology (SP)** Study of the human skeleton, identification of bones, allometric growth, sexual dimorphism, osteological genetic inheritance and environmental stresses. Lectures and demonstration. Corequisite: ANTH 3421L.

**ANTH3421L Human Osteology Laboratory (SP)** Laboratory exercises illustrating concepts of human osteology. Corequisite: ANTH 3423.

**ANTH3433 Human Evolution (SP)** A study of hominid evolution from origin to the present, including trends in comparative primate evolution and functional development of human form as a result of cultural and biological interaction.

**ANTH3443 Criminalistics: Forensic Sciences (SP)** Introduction to forensics focused on the scientific analysis of physical and biological evidence encountered in criminal investigations. Chemical, microscopic, biological, and observational techniques employed in the analysis of material evidence are described, discussed, and illustrated within an investigative framework. Topics include inorganic remains, fiber, tissue, human identification, fingerprints, tools, and weapons.

**ANTH3503 Power and Popular Protest in Latin America (FA)** This course focuses on the historical formation of Latin America by examining conflicts between the region's rich and poor. It includes both an historical perspective on the formation of ethnic, gender, and class relations in Latin America and a discussion of contemporary social problems.

**ANTH3513 Latinos in the U.S. (SP)** Why, when, and from where did differently situated groups of Latin Americans cross the border and become involved in U.S. agriculture. Once in the U.S., where did they settle, for whom did they work, and how did they organize (politically as well as culturally)?

**ANTH3523 Gender and Politics in Latin America (FA)** This course examines the ways in which political struggles surrounding land, labor, and the environment have been shaped by gender relations in Latin America. Why and how do peasant-workers engage their political worlds and how are such struggles shaped by gender?

**ANTH3533 Medical Anthropology (SP)** Survey of the interrelationship of human biology, culture and environment as reflected in disease experience from an evolutionary and cross cultural perspective. Special emphasis on stress.

**ANTH3903 Topics in Anthropology (FA, SP, SU)** Covers a special topic or issue. May be repeated for 12 hours.

**ANTH3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in anthropology).

**ANTH399VH Honors Course (1-6) (FA, SP)** May be repeated for 12 hours. Prerequisite: junior standing.

**ANTH4013 History of Anthropological Thought (FA)** Detailed consideration of anthropological theory through study of its historical development. The research paper in this course fulfills the Fulbright College research paper requirement for anthropology majors.

**ANTH4023 Egyptology (IR)** Explores multiple aspects of Ancient Egyptian civilization including chronology, art, religion, literature and daily life. Prerequisite: junior standing.

**ANTH4033 Popular Culture (SP)** 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.

**ANTH4093 The Archeology of Death (IR)** 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.

**ANTH4123 Ancient Middle East (SP)** The archeology of the ancient Middle East with emphasis upon the interaction of ecology, technology and social structure as it pertains to domestication and urbanization.

**ANTH4143 Ecological Anthropology (FA, SP, SU)** Anthropological perspectives on the study of relationships among human populations and their ecosystems.

**ANTH4153 Culture, History, and Political Economy (FA)** This course examines various aspects of the relationship between power and meaning, including concepts such as hegemony, resistance, and political consciousness. How do people produce and manipulate culture and history within the context of inequality and social change?

**ANTH4163 Globalization: Crisis, Conflict and Capitalist Development (SP)** This course examines the relationship between capitalist development and forms of political and cultural struggle. We explore theories of capitalist development and scholarly attempts to understand local experiences within the context of broader processes of capitalist change.

**ANTH4173 The Latin American City (IR)** 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.

**ANTH4233 Arctic Prehistory (SP)** Survey of prehistoric peoples and cultures of the North American Arctic and adjacent regions.

**ANTH4243 Archeology of the Midsouth (IR)** Survey of prehistoric and protohistoric cultures of the lower Mississippi Valley and adjacent regions. Prerequisite: junior standing.

**ANTH4256 Archeological Field Session (SU)** Practical field and laboratory experiences in archeological research. May be repeated for 12 hours. May be repeated for 12 hours.

**ANTH4253 Peoples and Cultures of World Regions (IR)** The anthropology (prehistory, peoples, and cultures) of a selected world region. Regional emphasis will vary but may include China, Europe, Northeast Asia, India or the Arctic. May be repeated for 12 hours. May be repeated for 12 hours.

**ANTH4353 Laboratory Methods in Archeology (IR)** Theory and practice of describing, analyzing, and reporting upon archeological materials.

**ANTH4363 Museums, Material Culture, and Popular Imagination (FA)** 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.

**ANTH4463L Museum Techniques Laboratory (SP)** Practical experience in museum laboratory techniques, and in design and execution of museum exhibits.

**ANTH4473 North American Prehistory (IR)** Survey of the aboriginal prehistory of the North American Continent north of Mexico.

**ANTH448V Individual Study of Anthropology (1-6) (FA, SP, SU)** Reading course for advanced students with special interests in anthropology.

**ANTH449V Special Problems in Museum Work (1-6) (IR)** Individual research, exhibit design and execution, or other problems of museum work.

**ANTH4513 African Religions: Gods, Witches, Ancestors (SP)** 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.

**ANTH4523 Dental Science (FA)** Introduction to the study of the human dentition including its anatomy, morphology, growth and development, and histology.

**ANTH4533 Middle East Cultures (SP)** Study of the peoples and cultures of the Middle East; ecology, ethnicity, economics, social organizations, gender, politics, religion, and patterns of social change. May be repeated for 9 hours.

**ANTH4543 Geographic Information Systems (SP)** Computer assisted analysis and display of geographic resource data. Course develops the theory behind spatial data analysis techniques, and reinforces the theory with exercises that demonstrate its practical applications. Prior experience with computers and/or completion of GEOG 4523 (Computer Mapping) is useful but not a prerequisite. (Same as GEOG 4543)

**ANTH4553 Introduction to Raster GIS (FA)** 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. (Same as GEOG 4553). (Same as GEOG 4553)

**ANTH4563 Vector GIS (FA)** 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 Arc-node based software and relational data bases. (Same as GEOG 4563)

**ANTH4573 Introduction to GRASS Applications in GIS (FA)** An introduction to geographic information systems (GIS) problem solving using the Geographic Resource Analysis Support System (GRASS) software. (Same as GEOG 4573)

**ANTH4583 Peoples and Cultures of Sub-Saharan Africa (FA)** An exploration of the people and places of Africa from a variety of anthropological perspectives. Classic and contemporary works will be studied 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.

**ANTH4593 Introduction to Global Positioning Systems (SP)** Introduction to navigation, georeferencing, and digital data collection using GPS receivers, data loggers, and laser technology for natural science and resource management. Components of NavStar Global Positioning system are used in integration of digital information into various GIS platforms with emphasis on practical applications. (Same as GEOG 4593)

**ANTH4613 Primate Adaptation and Evolution (FA)** Introduction to the biology of the order of Primates. This course considers the comparative anatomy, behavioral ecology and paleontology of our nearest living relatives. (Same as BIOL 4613) Prerequisite: ANTH 1013 (or BIOL 1543 and BIOL 1541L).

**ANTH4633 Archeological Prospecting & Remote Sensing (SP, Odd years)** 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. (Same as GEOS 4633) Corequisite: ANTH 4631L.

**ANTH4631L Archeological Prospecting & Remote Sensing Lab (SP, Odd years)** 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. Corequisite: ANTH 4633. Prerequisite: ANTH 4543 or GEOG 4543 or ANTH 4553 or GEOG 4553 or ANTH 4573 or GEOG 4573 or GEOL 1113 and ANTH 3023.

**ANTH4653 Advanced Raster GIS (SP, Odd years)** Advanced raster topics are examined beginning with a theoretical and methodological review of Tomlin's cartographic modeling principles. Topics vary and include Fourier methods, image processing, kriging, spatial statistics, principal components, fuzzy and regression modeling, and multi-criteria decision models. Several raster GIS programs are examined with links to statistical analysis software. Prerequisite: ANTH 4553 or GEOG 4553.

**ANTH4803 Historical Archeology (IR)** Review of the development of historical archeology and discussion of contemporary theory, methods, and substantive issues. Lab sessions on historic artifact identification and analysis.

**ANTH4813 Ethnographic Approaches to the Past (IR)** 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.

**ANTH4863 Quantitative Anthropology (FA)** 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. (Same as GEOG 4863)

**ANTH4860L Quantitative Anthropology Laboratory (FA)**

**ANTH4903 Seminar in Anthropology (FA, SP, SU)** Research, discussion, and projects focusing on a variety of topics. May be repeated for 12 hours. May be repeated for 12 hours.

**ANTH4913 Topics of the Middle East (FA, SP, SU)** Covers a special topic or issue. May be repeated for 9 hours.

**ANTH500V Advanced Problems in Anthropology (1-18) (FA, SP)** Individual research at graduate level on clearly defined problems or problem areas.

**ANTH5013 Research Methods in Anthropology (FA)** Investigation of the nature of inquiry; scientific and other approaches to the perception of anthropological data; the development and use of research models; organization of observations; numerical and other methods of analyzing and interpreting data.

**ANTH5023 Public Archeology (SP)** Practical problems of archeology in relation to federal and state needs, legislative requirements, contract research, public support and information need, and the job market.

**ANTH5033 Settlements, Sites, and Models (SP, Even years)** The modeling of potential archaeological

resource locations within regions receives significant resources and funding from government and private sectors. The theoretical and methodological basis behind such models is examined, as are the history, controversies, key issues, individuals, and the important role of GIS technology and statistical methods. Prerequisite: ANTH 4543 or GEOG 4543 or ANTH 4553 or GEOG 4553.

**ANTH5053 Quaternary Environments (FA)** 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. (Same as GEOG 5053, GEOL 5053)

**ANTH5153 Topics in Anthropology (FA, SP, SU)** Graduate level seminar with varied emphasis on topics relating to cultural anthropology. May be repeated.

**ANTH5203 Applications of Archeological Method and Theory (FA)** 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.

**ANTH525V Topics in Archeology (1-6) (FA, SP, SU)** Graduate level seminar with varied emphasis on topics relation to archeology. May be repeated.

**ANTH5263 Indians of Arkansas and the South (FA)** Study of the traditional lifeways and prehistoric backgrounds of Indians living in the southern United States, including Arkansas.

**ANTH5303 Applications of Method and Theory in Biological Anthropology (IR)** 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.

**ANTH5333 Social Organization (FA)** Comparative study of social organization focusing primarily on pre-industrial and non-western cultures. Primary topics are variation in kinship, kinship groups, kinship terminological analysis, marriage, and current developments in social structure.

**ANTH535V Topics in Physical Anthropology (1-6) (FA, SP)** Graduate level seminar with varied emphasis on topics relating to physical anthropology. May be repeated.

**ANTH5413 Bioarcheology Seminar (SP, Even years)** Intensive coverage of bioarcheological method and theory with the context of both academic and cultural resources management research.

**ANTH5423 Human Evolutionary Anatomy (IR)** Paleobiologists reconstruct past lifeways and systematic relationships of our ancestors using comparative studies of bony morphology and associated soft tissues. This course surveys methods and theories used to infer function and phylogeny, and details relevant aspects of the anatomy of humans, living great apes, and fossil human ancestors. (Same as BIOL 5423) Prerequisite: ANTH 1013 and BIOL 1543.

**ANTH5443 Cultural Resource Management I (IR)** 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.

**ANTH546V Special Problems in Museum Work (1-6) (IR)** Individual research, exhibit design and execution, or other problems of museum work.

**ANTH561V Field Research in Archeology (1-6) (IR)** Directed graduate level archeological fieldwork.

**ANTH600V Master's Thesis (1-6) (FA, SP, SU)**

**ANTH610V Internship (1-18) (FA, SP, SU)**

**ANTH681V Seminar: Cultural Anth (3-9) (FA, SP)** Variable topics in Cultural Anthropology will be explored in depth.

**ANTH682V Seminar: Archeology (3-9) (FA, SP)** Variable topics in Archeology will be explored in depth.

**ANTH683V Seminar: Biological Anth (3-9) (FA, SP, SU)** Variable topics in Biological Anthropology will be explored in depth.

**ANTH700V Doctoral Dissertation (3-9) (FA, SP)**



**(ARAB) ARABIC**

**ARAB1003 Elementary Arabic I (SP)** Stresses correct pronunciation, aural comprehension, simple speaking ability. Basic grammar is taught inductively through oral and written skills.

**ARAB1016 Intensive Arabic I (FA)** Equivalent to 1003 and 1013. Stresses correct pronunciation, aural comprehension, simple speaking ability. Basic grammar is taught inductively through oral and written skills.

**ARAB1013 Elementary Arabic II (FA)** Continues to stress correct pronunciation, aural comprehension, simple speaking ability. Continued presentation of grammar with special attention to basic morphology. Prerequisite: ARAB 1003 or equivalent.

**ARAB2003 Intermediate Arabic I (FA)** Leads to greater oral comprehension and speaking ability and develops the more advanced reading and writing skills. Prerequisite: ARAB 1013 or equivalent.

**ARAB2016 intensive Arabic II (SP)** Equivalent to 2003 and 2013. Leads to greater oral comprehension and speaking ability and develops the more advanced reading and writing skills. Emphasizes morphology and syntax. Prerequisite: ARAB 1013 or ARAB 1016.

**ARAB2013 Intermediate Arabic II (SP)** Continued development of speaking, comprehension, reading, and writing. Emphasizes morphology and syntax. Prerequisite: ARAB 2003.

**ARAB3003 Intermediate Arabic III (FA, SP)** Continued development of speaking, comprehension, reading and writing. Emphasizes morphology and syntax with increased focus on reading and writing. Students begin to express ideas and opinions. Prerequisite: ARAB 2013.

**ARAB3016 Intensive Arabic III (FA)** Leads to greater facility in the spoken language and continues to develop reading and writing skills. Continued emphasis on morphology and syntax. Prerequisite: ARAB 2016.

**ARAB3013 Intermediate Arabic IV (FA, SP)** Continued development of speaking, comprehension, reading and writing. Completes introduction of standard language skills required for functional ability in an Arabic-speaking environment. Prerequisite: ARAB 3003.

**ARAB4016 Intensive Arabic IV (SP)** Continued development of speaking, comprehension, reading, writing. Reading assignments introduce a variety of styles ranging from classical to modern in both prose and verse. Prerequisite: ARAB 2026 or equivalent.

**ARAB4023 Advanced Arabic I (FA)** Development of advanced speaking and writing skills. Extensive reading and writing assignments and translating exercises from English into Arabic. Prerequisite: ARAB 4016.

**ARAB4033 Advanced Arabic II (SP)** Continued advanced speaking, reading, and writing skills. Prerequisite: ARAB 4023.

**ARAB4043 Advanced Conversation (IR)** Continued development of aural comprehension and speaking skills in one of the major Arabic dialects.

**ARAB4053 Arabic Readings (FA, SP, SU)** Develops skill in description, analysis, and argumentation through weekly reading and writing assignments within a workshop atmosphere. Selected readings from various styles of standard Arabic, ranging from newspapers to literary texts.

**ARAB4113 Modern Arabic Literature (IR)** Selected readings from Arabic fiction and poetry from the 20th century to the present. Prerequisite: ARAB 4033.

**ARAB4213 Introduction to Arab Culture (IR)** Selected readings from Arab history, literature, the Islamic Tradition, and the Holy Qur'an. Prerequisite: ARAB 4033.

**ARAB470V Special Topics (1-6) (FA, SP, SU)** May be offered in a topic not specifically covered by courses otherwise listed. May be repeated.

**ARAB575V Special Investigations (1-3) (FA, SP, SU)** May be repeated.

**(ARCH): ARCHITECTURE**

**ARCH1003 Basic Course in the Arts: Architecture Lecture (FA, SP, SU)** Introduction to architecture, emphasizing the origins and development of architecture and objective criteria for its evaluation. For the general student. May not be presented towards satisfaction of major requirements in either the B.Arch. or B.A. in architectural studies degrees.

**ARCH1015 Architectural Design I (FA, SU)** Seeing, drawing: analysis and graphic communication. Subject and object: expression and craft. Studio and seminars 12 hrs per week.

**ARCH1025 Architectural Design II (SP, SU)** Ideation, visualization, representation. Project sequence designed to develop perceptual and conceptual abilities; formal and spatial composition and synthesis. Studio and seminars 12 hours per week. Prerequisite: ARCH 1015.

**ARCH1211 Introduction to Architecture I (FA, SU)** (Formerly ENVD 1211) Interdisciplinary introduction to basic principles of design, from furniture and the room to buildings and the natural landscape. Urbanism and the public realm. Lecture 1 hour per week.

**ARCH1221 Introduction to Architecture II (SP, SU)** (Formerly ENVD 1221) Theoretical, formal, and constructive principles and their impact in the design disciplines, modernism and after. Introduction to the intellectual and philosophical foundations of design theory. Lecture 1 hour per week. Prerequisite: ARCH 1211.

**ARCH2016 Architectural Design III (FA)** Introduction of formal principles and strategies used in space making, focusing on the development of plans and sections. Precedents and the understanding of them through analysis and syntheses are used as a means of examining the past and the present while providing a framework from which personal design sensibilities can evolve. Corequisite: ARCH 2114 and ARCH 2233. Prerequisite: ARCH 1025.

**ARCH2026 Architectural Design IV (SP)** An elaboration of space-making, addressing three-dimensional aspects of form-making, including the influence of structural systems, articulation of the vertical section, and exterior expression; the role of site as a generator of form; and the overarching importance of technics, including the materiality of space, structure, and light. Corequisite: ARCH 2124. Prerequisite: ARCH 2016.

**ARCH2114 Architecture Technology I (FA)** (Formerly ARCH 2113) Introduction to the fundamentals of building systems technology. Emphasis on the interrelationships of site, environmental, structure, and enclosure systems. Focus on the integration of all systems within the conceptual and functional organization of the building and its context. Corequisite: ARCH 2016. Prerequisite: ARCH 1025 and ARCH 1221.

**ARCH2124 Architecture Technology II (SP)** Study of force systems, section properties, equilibrium and stability of building structures. Relationship of material properties and structural member behavior to the forces acting on the building structural system. Specific topics are: stress/strain relationships of various materials; types of stress; shear and moment diagrams; design and analysis of simple wood and steel framing systems; introduction to indeterminate structures; and use of structural analysis computer programs. Three hours of lecture and one hour of laboratory exercises in principles and practices of architectural technology each week. Corequisite: ARCH 2026. Prerequisite: ARCH 2114, PHYS 1044, and PHYS 1040L.

**ARCH2233 History of Architecture I (FA)** Critical study and analysis of architecture from ancient times through the middle ages, including pre-classical, classical, early Christian, Byzantine, Proto-Romanesque, Romanesque, and Gothic periods.

**ARCH2233H Honors History of Architecture I (FA)** Critical study and analysis of architecture from ancient times through the middle ages, including pre-classical, classical, early Christian, Byzantine, Proto-Romanesque, Romanesque, and Gothic periods.

**ARCH2243 History of Architecture II (SP)** Critical study and analysis of western architecture from the renaissance to the mid-nineteenth century. Prerequisite: ARCH 2233.

**ARCH2243H Honors History of Architecture II (SP)** Critical study and analysis of western architecture from the renaissance to the mid-nineteenth century. Prerequisite: ARCH 2233.

**ARCH3016 Architectural Design V (FA)** Emphasis on issues of design process, exploration of internal and external determinants of form and the integration of appropriate technologies in design solutions. Corequisite: ARCH 3134. Prerequisite: ARCH 2026.

**ARCH3026 Architectural Design VI (SP)**

Continuation of Architectural Design V. Corequisite: ARCH 3144. Prerequisite: ARCH 3016.

**ARCH302V Seminar (1-3) (SP, SU)** Seminars in subjects of special interest to students and faculty. May be repeated.

**ARCH303V Special Projects (1-6) (IR)** Individual or group investigation in research, visual communication, history, or design concerning special interests of student or faculty. May be repeated.

**ARCH303VH Honors Special Projects (1-6) (IR)** Individual or group investigation in research, visual communication, history, or design concerning special interests of student or faculty. May be repeated.

**ARCH3134 Architectural Technology III (SP)** In-depth discussions concerning the nature, behavior and appropriate uses of materials for building construction. Introduction to detailing of enclosure systems for buildings. Introduction to concrete structural systems, analysis and design. Three hours of lecture and one hour of laboratory exercises in principles and practices of architectural technology each week. Corequisite: ARCH 3016. Prerequisite: ARCH 2124.

**ARCH3133 Architectural Presentation (IR)** A study of basic techniques in architectural presentation drawing and rendering, including studio problems designed to develop skills in various black and white and color media. Studio 6 hours per week.

**ARCH3144 Architectural Technology IV (SP)** Emphasis on structural, mechanical, plumbing, electrical, fire protection, natural and electric lighting systems and environmental considerations of energy usage, code requirements, system selection and integration. Three hours lecture and one hour laboratory exercises in principles and practices of architectural technology each week. Corequisite: ARCH 3026. Prerequisite: ARCH 3134.

**ARCH3743 Furniture Design (IR)** Design concepts and techniques to acquaint the student with the design of furniture; analysis of function, development of design and construction of small pieces of furniture.

**ARCH4016 Architectural Design VII (FA)** Emphasis on issues of typology, context and technological suitability as sources of theoretical and developmental responses. Prerequisite: ARCH 3026.

**ARCH4026 Architectural Design VIII (SP)** Continuation of Architectural Design VII. Prerequisite: ARCH 4016.

**ARCH4023 Advanced Architectural Studies (FA, SP)** Advanced seminars in subjects to special interest to students and faculty. May be repeated.

**ARCH4023H Honors Advanced Architectural Studies (FA, SP)** Advanced seminars in subjects to special interest to students and faculty. May be repeated.

**ARCH4154 Architectural Technology V (FA, SP)** Introduction to high-rise, speciality and contemporary structural systems. Computer analysis of structural systems. Advanced detailing and integration of building systems. Study of acoustics and intelligent building systems. Introduction to organization, preparation, and context of construction drawings. Three hours lecture and one hour laboratory exercises in principles and practices of architectural technology each week. Prerequisite: ARCH 3144.

**ARCH4433 History of Architecture III (FA)** Critical study and analysis of the history and theories of modern architecture from the mid-nineteenth century to the present. Prerequisite: ARCH 2233 and ARCH 2243 (or HESC 2883 and HESC 3883).

**ARCH4433H Honors History of Architecture III (FA)** Critical study and analysis of the history and theories of modern architecture from the mid-nineteenth century to the present. Prerequisite: ARCH 2233 and ARCH 2243 (or HESC 2883 and HESC 3883).

**ARCH4443 History of Architecture IV (SP, SU)** An intensive study of the history and theory of architecture since 1965, through critical inquiry and analysis of seminal ideas and artifacts that have shaped the built environment and our ways of knowing it. Prerequisite: ARCH 2233 and ARCH 2243 and ARCH 4433.

**ARCH4473 Eastern Art and Architecture (IR)** A study of the development of Indian, Chinese, and Japanese art forms with an emphasis on architecture.

**ARCH4483 Architecture of the Americas (IR)** Study of the development of architecture in the Americas from the Pre-Columbian cultures to the present day. Lecture and slides 3 hours per week.

**ARCH4610 Architecture Cooperative Education I (FA, SP, SU)** A practicum that introduces and engages the

student in the practice and application of the profession. Prerequisite: completion of all third year program requirements, 2.5 minimum GPA and permission of the faculty.

**ARCH4620 Architectural Cooperative Education II** (FA, SP, SU) A practicum that introduces and engages the student in the practice and application of the profession. Prerequisite: completion of all third year program requirements, 2.5 minimum GPA and permission of the faculty.

**ARCH4630 Architectural Cooperative Education III** (FA, SP, SU) A practicum that introduces and engages the student in the practice and application of the profession. Prerequisite: completion of all third year program requirements, 2.5 minimum GPA and permission of the faculty.

**ARCH4640 Architectural Cooperative Education IV** (FA, SP, SU) A practicum that introduces and engages the student in the practice and application of the profession. Prerequisite: completion of all third year program requirements, 2.5 minimum GPA and permission of the faculty.

**ARCH4913 Design Thinking: Relationships Between Theory and Process** (IR) Studies of the relationship between design theory and process using examples from history with emphasis on contemporary development and roots. Prerequisite: ARCH 4433.

**ARCH5016 Architectural Design IX** (FA, SU) Comprehensive project with complex program covering issues at both urban and architectural scales. Students synthesize the knowledge and critical thinking acquired during the previous four years of their education including theory, history and technology and programming. Corequisite: ARCH 5162.

**ARCH5026 Architectural Design X** (FA, SP, SU) Final design studio. Offers projects with complex building programs, site and context issues. Students are expected to demonstrate skills in generating design ideas supported by clear understanding of issues, carrying designs from initial concept to final project, and ability to integrate building technology. Prerequisite: ARCH 5016.

**ARCH5162 Architectural Technology VI** (FA) Synthesis of building technologies, systems selection, systems design, and construction methods appropriate for comprehensive studio project (ARCH 5016). Required readings in emerging technologies of building construction. Corequisite: ARCH 5016 and ARCH 5026. Prerequisite: ARCH 4154.

**ARCH5173 Architectural Technology VII: Vernacular Systems** (IR) Traditional, alternative and craft-based technologies. Sustainable systems and materials research. Lectures, labs and hands-on construction projects. Prerequisite: ARCH 4154.

**ARCH5253 Architectural Structures Seminar** (IR) Advanced discussion, investigation, design, and analysis of structural systems, forms, and materials as determinants of architectural design. May be repeated for 6 hours.

**ARCH5314 Architectural Professional Practice** (FA) Study of role and responsibility of the architect, owner, and contractor relationships; professional ethics; organization of the architect's office; contracts and other documents; risk management strategies; and the preparation of the technical specifications and bidding documents of the Project Manual. Prerequisite: ARCH 4026.

**ARCH5323 Legal Aspects of Architecture and Practice** (IR) A survey of the various legal doctrines affecting architecture and their impact on its practice. Topics include the contracting process, professional liability, risk management, and legal constraints on design, e.g., land use controls, building codes, and copyright law. Ethical and economic issues are also considered.

**ARCH5493 History of Urban Form** (FA) Study of the physical form of cities from ancient Greece to contemporary America with emphasis on urban form as an expression of physical and cultural determinants. Included are investigations into the history, theory, and practice of urban design. Prerequisite: ARCH 2233 and ARCH 2243 and ARCH 4433.

**ARCH5643 Architectural Computer Applications** (IR) Digital computer programming and introduction to the use of computers as design and realization tools.

**ARCH5933 Preservation and Restoration** (IR) History of the preservation and restoration movement in Europe and the U.S.; its relation to the contemporary urban planning and renewal. Modern economic and administrative techniques of preservation. Participation in history surveys at regional and state levels.

## (ARED) ART EDUCATION

**ARED3603 Public School Art for Elementary Schools** (FA, SP) Selection, preparation, and use of instructional materials for art in the elementary school. Artistic development of the child and implications to learning in art and other academic areas. Prerequisite: ARTS 1003 and ARHS 1003 and admission to teacher education.

**ARED3613 Public School Art I** (IR) Selection, preparation and use of instructional materials in elementary and secondary schools. For students seeking teaching certification in art. Prerequisite: ARTS 1013 and ARTS 1313 and ARTS 1323 and ARTS 2013.

**ARED3643 Teaching Art in Elementary Schools** (SP) Methods and materials used in teaching elementary school art. Prerequisite: ARED 3613.

**ARED3653 Teaching Art in Secondary Schools** (FA, SP, SU) Methods and materials used in teaching secondary school art. Prerequisite: ARED 3603 or ARED 3613.

**ARED476V Student Teaching in Art (6-12)** (FA, SP, SU) A minimum of 6 weeks will be spent in an off-campus school. During this time the student teacher will have an opportunity under supervision to observe, to teach and participate in other activities involving the school and community. Prerequisite: BFA degree in Art Education.

## (ARHS) ART HISTORY

**ARHS1003 Basic Course in the Arts: Art Lecture** (FA, SP, SU) A general introduction to the visual arts. Lectures on theory and criticism, demonstrations, films, and slides. Three hours a week plus attendance at specified programs and exhibits. May not be presented toward satisfaction of the B.A. fine arts requirement by art majors.

**ARHS1003H Honors Basic Course in the Arts: Art Lecture** (IR) A general introduction to the visual arts. Lectures on theory and criticism, demonstrations, films, slides. Three hours a week plus attendance at specified programs and exhibits. May not be presented toward satisfaction of the B.A. fine arts requirement by art majors.

**ARHS2913 Art History Survey I** (FA) Survey of art works from Stone Age through Medieval.

**ARHS2923 Art History Survey II** (SP) Survey of art works from Renaissance to the present.

**ARHS4813 The History of Photography** (IR) Survey of photography from 1685 to present.

**ARHS4833 Ancient Art** (SP, Even years) Study of the visual arts of Mesopotamia, Egypt, Greece, and The Roman Empire. Prerequisite: ARHS 2913.

**ARHS4843 Medieval Art** (FA, SP, SU) Study of Early Christian, Byzantine, Early Medieval, Romanesque, and Gothic styles. Prerequisite: ARHS 2913.

**ARHS4843H Honors Medieval Art** (FA, SP, SU) Study of Early Christian, Byzantine, Early Medieval, Romanesque, and Gothic styles. Prerequisite: ARHS 2913.

**ARHS4853 Italian Renaissance Art** (FA, SP, SU) Study of Proto-Renaissance, Early, High Renaissance, and Mannerist styles in Italy. Prerequisite: ARHS 2923.

**ARHS4863 Northern Renaissance Art** (FA, SP, SU) Study of Late Gothic and Renaissance styles in the Netherlands, Germany, and France. Prerequisite: ARHS 2923.

**ARHS4873 Baroque Art** (FA, SP, SU) Study of art styles of the 17th and 18 centuries, primarily in Italy, Spain, France, Flanders, and the Netherlands. Prerequisite: ARHS 2923.

**ARHS4883 19th Century European Art** (FA, SP, SU) Study of Neo-Classical, Romanticist, Realist, Impressionist, and Post-Impressionist styles. Prerequisite: ARHS 2923.

**ARHS4893 20th Century European Art** (FA, SP, SU) Study of the major styles and movements of the century, including Cubism, Fauvism, German Expressionism, and Surrealism. Prerequisite: ARHS 2923.

**ARHS4913 American Art to 1900** (FA, SP, SU) The visual arts in the United States from their beginning in Colonial times through the nineteenth century. Prerequisite: ARHS 2923.

**ARHS4913H Honors American Art to 1900** (FA, SP, SU) The visual arts in the United States from their beginning in Colonial times through the nineteenth century. Prerequisite: ARHS 2923.

**ARHS4923 American Art Since 1900** (FA, SP, SU) The visual arts in the United States from the turn of the century to the contemporary era. Prerequisite: ARHS 2923.

**ARHS4943 Seminar in Art Criticism** (FA, SP, SU) Study and problems in the criticism of art forms and

**ARHS4943H Honors Seminar in Art Criticism** (FA, SP, SU) Study and problems in the criticism of art forms and

**ARHS4963 Individual Research in Art History** (FA, SP) Independent study in specific areas of art history and criticism. Prerequisite: 12 hours of art history.

**ARHS4963H Honors Individual Research in Art History** (FA, SP) Independent study in specific areas of art history and criticism. Prerequisite: 12 hours of art history.

**ARHS4973 Seminar in Art History** (FA, SP, SU) Special studies of periods and styles of art. Prerequisite: 6 hours of art history.

**ARHS4983 Special Topics in Art History** (IR) 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) for up to 6 hours. Prerequisite: ARHS 2913 or ARHS 2923.

**ARHS4993 Special Topics in Modern Art** (IR) 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) for up to 9 hours. Prerequisite: ARHS 2923.

**ARHS6943 Seminar: Critical Thought in Art** (FA) Explore topics of concern to the studio artist involving underlying concepts and purposes of art as well as models and methods for the analysis of art. Course based on discussions of selected readings, prepared papers and seminar reports. Prerequisite: graduate standing.

## (ARSC) ARTS AND SCIENCES

**ARSC1001 First Year Experience** (FA) Open to incoming freshman and transfer students participating in the university's First Year Experience. Available for credit only.

**ARSC300V Study Abroad (1-15)** (FA, SP, SU) Open to undergraduate students studying abroad in officially sanctioned programs. May be repeated for 24 hours.

**ARSC310V Cooperative Education (1-4)** (FA, SP, SU) Required of participants in cooperative education work assignments. Available for credit only. May be repeated for 36 hrs.

**ARSC500V Study Abroad (3-12)** (FA, SP, SU) Open to graduate students studying abroad in officially sanctioned programs. May be repeated for 24 hours.

## (ARTS) ART

**ARTS1003 Basic Course in the Arts: Art Studio** (FA, SP, SU) Provides experience through participation in the arts.

**ARTS1013 Drawing Fundamentals I** (FA, SP) Problems dealing with materials and techniques of drawing, including basic concepts of line, perspective, and value.

**ARTS1313 Two-Dimensional Design** (FA, SP) Studio problems in the use of line, shape, texture, value, and color and their relationships.

**ARTS1323 Three-Dimensional Design** (FA, SP) Studio problems with the elements of three-dimensional design: structure, space, form, surface, and their relationship.

**ARTS2003 Drawing Fundamentals II** (FA, SP) Continuation of Drawing Fundamentals. Prerequisite: ARTS 1013.

**ARTS2013 Figure Drawing I** (FA, SP) Continuation of drawing fundamentals with emphasis upon human figure studies. Prerequisite: ARTS 1013.

**ARTS2023 Alternative Methods of Drawing** (IR) Study of experimental drawing methods including abstract and non-representational drawing, conceptual and symbolic drawing, imaginative drawing, and collage. Prerequisite: ARTS 2003.

**ARTS2313 Computer Applications in Art** (FA) Introduction to digital imaging in the visual arts, beginning instruction in digital image creation, manipulation and processing. Introduction to input and output peripherals, computer graphic software programs and and work in the digital visual arts. Prerequisite: ARTS 1313.

**ARTS3023 Drawing III** (FA) Advanced studies and problems in drawing techniques and Prerequisite: ARTS 2013.



**ARTS3103 Painting I (FA, SP)** An exploration of different ways of articulating visual forms on a picture plane, using common materials and procedures. Pre- or Corequisite: ARTS 1313 and ARTS 2013 or ARCH 1025.

**ARTS3113 Painting II (FA, SP)** An expanded use of materials, procedures, subject matter, and approaches. Prerequisite: ARTS 3103.

**ARTS3123 Watercolor Painting I (FA, SP)** An exploration of different ways of articulating visual forms on a picture plane, using common materials and procedures. Prerequisite: ARTS 1313 and ARTS 1323 and ARTS 2013.

**ARTS3203 Sculpture I (SP)** Additive and subtractive techniques using clay and plaster and including basic casting. Prerequisite: ARTS 1313 and ARTS 1323 and ARTS 2013.

**ARTS3213 Sculpture II (SP)** Subtractive techniques using wood and stone; additive fabrication techniques in a variety of materials. Prerequisite: ARTS 3203.

**ARTS3333 Color Studies (FA, SP)** Investigation of color qualities and relationships through research and studio problems. Prerequisite: ARTS 1313 and ARTS 1323 and ARTS 2013.

**ARTS3363 Graphic Design I (FA, SP)** Introduction to basic principles and theories of typography, layout, and logo design. Visualization and production of ideas through traditional and computer techniques. Prerequisite: ARTS 1013 and ARTS 1313 and ARTS 1323.

**ARTS3403 Etching I (SP)** Introduction to intaglio and relief. Prerequisite: ARTS 1313 and (ARTS 2003 or ARTS 2013 or ARTS 2023).

**ARTS3413 Etching II (SP)** Advanced work in intaglio or relief. Students select one area for study. Intaglio emphasizes working with copper plates and color printing. Background in color studies preferred but not mandatory. Prerequisite: ARTS 3403 or ARTS 3463.

**ARTS3423 Printmaking-Lithography (FA)** Introduction to lithography with emphasis on stone lithographic techniques. Prerequisite: ARTS 1313 and (ARTS 2003 or ARTS 2013 or ARTS 2023).

**ARTS3433 Lithography II (FA)** Advanced study with emphasis on color printing and plate lithography techniques. Prerequisite: ARTS 3423.

**ARTS3443 Serigraphy I (FA, SU)** Introduction to serigraphy techniques, including cut stencil, resist methods, and photosensitized screens. Some knowledge of photography preferred, but not mandatory. Prerequisite: ARTS 1313 and (ARTS 2003 or ARTS 2013 or ARTS 2023).

**ARTS3453 Serigraphy II (FA, SP)** Continuation of the study and use of serigraphy techniques. Prerequisite: ARTS 3443.

**ARTS3463 Introduction to Printmaking (FA, SP, SU)** Introduces the student to printmaking through primary methods used in relief, serigraphic, intaglio, and lithographic techniques. Prerequisite: ARTS 1013 and (ARTS 2003 or ARTS 2013 or ARTS 2023).

**ARTS3503 Ceramics: Handbuilt I (FA, SP)** Study of ceramic design and handbuilding techniques. Prerequisite: ARTS 1313 and ARTS 1323 and ARTS 2013.

**ARTS3513 Ceramics: Introduction to Slip-Casting (SP)** Study of mold-making and slip-casting techniques. Focus on sculptural and conceptual thinking, technical understanding of clay slips and firing processes. Prerequisite: ARTS 3503 and ARTS 3523.

**ARTS3523 Ceramics: Wheelthrown I (FA, SP)** Study of ceramic design and wheel-forming techniques. Prerequisite: ARTS 1313 and ARTS 1323 and ARTS 2013.

**ARTS3533 Ceramics: Wheelthrown II (FA, SP)** Advanced work in wheel-forming techniques and glaze calculations. Prerequisite: ARTS 3523.

**ARTS3803 Photography I (FA, SP)** Beginning photography. Introduction to B & W materials, techniques, and theory. Development of visual ideas through assignments, critiques, slide lectures, and demonstrations. Prerequisite: ARTS 1313.

**ARTS3813 Alternative Photographic Processes (FA, SP, SU)** Advanced B & W materials, techniques, and theory. Introduction to "non-traditional" materials, techniques, and theory (Cyanotype, Van Dyck Brownprint, Gum Biochromate, KWIK-PRINT, etc.). Assignments, critiques, slide lectures, and demonstrations. Prerequisite: ARTS 3803.

**ARTS4023 Figure Drawing II (IR)** Advanced study of the figure with emphasis on figure structure and its relationship to pictorial form in drawing. Prerequisite: ARTS 2013.

**ARTS4033 Drawing IV (FA, SP)** Continued advanced studies and problems in drawing techniques and varied subjects. Prerequisite: ARTS 3023.

**ARTS404V Special Problems in Drawing (1-6) (FA, SP, SU)** Individual projects in drawing arranged with the instructor. May be repeated for 6 hours. Prerequisite: ARTS 3023.

**ARTS4143 Painting III (FA, SP)** Concentration of the coordination of the technical, esthetic, and creative aspects of painting. Prerequisite: ARTS 3113.

**ARTS4163 Painting IV (FA, SP)** Continued advanced concentration on the coordination of the technical, aesthetic, and creative aspects of painting. Prerequisite: ARTS 4143.

**ARTS417V Special Problems in Painting (1-6) (FA, SP)** Individual technique and subject matter projects to be arranged with the instructor. May be repeated for 6 hours. Prerequisite: ARTS 4143 or ARTS 4153.

**ARTS4213 Sculpture III (FA, SP)** Continued work in sculpture techniques with emphasis on casting. Prerequisite: ARTS 3213.

**ARTS4223 Sculpture IV (FA, SP)** Continued work in sculpture techniques with emphasis on ferrous and non-ferrous welding. Prerequisite: ARTS 3203 and ARTS 3213.

**ARTS423V Special Problems in Sculpture (1-6) (FA, SP)** Individual projects in sculpture with emphasis on materials exploration. May be repeated for 6 hours. Prerequisite: ARTS 4223.

**ARTS4343 Advanced Design (SP)** Studio problems in the interrelationships of two and three-dimensional elements in traditional and experimental media. Prerequisite: ARTS 1313 and ARTS 1323.

**ARTS435V Special Problems in Design (1-6) (FA, SP)** Extended problems in an area of interest in pure or functional design; encouraged use of imaginative materials. May be repeated for 6 hours. Prerequisite: ARTS 4343.

**ARTS4363 Graphic Design Typography (FA, SP)** The primary emphasis of this course is on the aesthetics of letter forms and understanding the symbolic communication inherent in different type faces. Typographic relationships will be investigated through experimental problems and projects such as logos, posters, and brochures. Prerequisite: ARTS 3363.

**ARTS4373 Graphic Design: Symbols (FA, SP)** Projects focus on the development of logos, pictographs, symbols, and conceptual symbolism, with study of the history of symbol generation. Ideas are visualized through traditional and computer techniques. Presentation of work and development of portfolio pieces are emphasized. Prerequisite: ARTS 3363.

**ARTS4383 Graphic Design: Layout (FA, SP)** Projects focus on the organizational principles and practices of layout design, with a study of contemporary design and graphic design history. Ideas are visualized through traditional and computer techniques. Presentation of work and development of portfolio pieces are emphasized. Prerequisite: ARTS 3363.

**ARTS439V Special Problems in Graphic Design (1-6) (FA, SP)** Advanced individual projects in graphic design. May be repeated for 6 hours. Prerequisite: ARTS 4363 or ARTS 4373 or ARTS 4383.

**ARTS4463 Etching III (FA, SP)** Continued study of intaglio or relief. Prerequisite: ARTS 3413.

**ARTS4473 Lithography III (FA)** Continued advanced study of lithography techniques. Prerequisite: ARTS 3433.

**ARTS4483 Printmaking IV (FA, SP)** Continued advanced study in various printmaking media. Prerequisite: ARTS 4463 or ARTS 4473.

**ARTS449V Special Problems in Prints (1-6) (FA, SP)** Individual projects in one area of printmaking. May be repeated for 6 hours. Prerequisite: ARTS 4463 or ARTS 4473.

**ARTS4553 Ceramics-Handbuilding III (FA, SP)** Continued advanced work in handbuilding techniques and glaze calculation. Prerequisite: ARTS 3513.

**ARTS4563 Ceramics-Wheelthrown III (FA, SP)** Continued advanced work in wheel-throwing techniques and/or glaze calculation. Prerequisite: ARTS 3533.

**ARTS4573 Ceramics IV (FA, SP)** Continued advanced study in either handbuilding or wheel-throwing techniques and/or glaze calculations. Prerequisite: ARTS 4553 or ARTS 4563.

**ARTS458V Special Problems in Ceramics (1-3) (FA, SP)** Individual projects in ceramic techniques. May be repeated for 6 hours. Prerequisite: ARTS 3503 or ARTS 3523.

**ARTS459V Individual Instruction (1-6) (FA, SP)** Special projects on an arranged basis for advanced students in any area of art in which the catalog sequence of courses has been completed. May be repeated for 6 hours.

**ARTS4823 Color Photography I (IR)** Introduction to

color production. Color materials, techniques and theory. Direct reversal transparencies and prints, color negative processing and printing, and manipulation of color materials. Assignments, demonstrations, critiques, and lectures. Prerequisite: ARTS 3803.

**ARTS4833 Advanced Photography (FA)** Individual problems in photography with optional study in areas of color, slide production, and photography application to other art media. Prerequisite: ARTS 3803.

**ARTS484V Special Problems in Photography (1-6) (FA, SP)** Individual instruction for advanced undergraduates and graduate students. Special projects in photography designated by students in collaboration with faculty. May be repeated for 6 hours. Prerequisite: ARTS 3803 and (ARTS 3813 or ARTS 4823 or ARTS 4833).

**ARTS490VH Honors Course (1-6) (FA, SP)** Special problems in studio, art history, art criticism or a combination of these. May be repeated for 12 hours. Prerequisite: junior standing.

**ARTS491V Internships in Art (1-3) (FA, SP, SU)** Credit for practical experience gained through internships in studio art, art history, gallery practices and/or art education. Report required from intern and field supervisor on significant accomplishments and/or progress. May be repeated for 6 hours. Prerequisite: junior standing and art major.

**ARTS4921 Workshop: Professional Practices in Art (SP)** A workshop in professional artistic practices including portfolio presentation, matting, framing, writing resumes, making slides of work, health and safety issues, opportunities, etc. Prerequisite: Art majors only. Requires junior, senior or graduate standing.

**ARTS493V Fine Arts Gallery Internship (1-3) (FA, SP, SU)** 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.

**ARTS494V Graphic Design Internship (1-6) (FA, SP, SU)** Credit for practical experience gained through internship in graphic design. Report required from intern and field supervisor on progress and significant accomplishments. 3 credit hours per semester. May be repeated for 6 hours. Prerequisite: ARTS 4363 or ARTS 4373 or ARTS 4383.

**ARTS495V Special Topics (1-6) (IR)** May be offered in a subject not specifically covered by the courses otherwise listed. May be repeated for 6 hours.

**ARTS498V Senior Thesis (1-6) (FA, SP, SU)**

**ARTS5013 Graduate Drawing (FA)** Graduate level study of drawing materials and techniques. Prerequisite: graduate standing.

**ARTS5901 Graduate Critique (FA, SP, SU)** Art faculty review and critique of M.F.A. student's art works. Prerequisite: admission into the M.F.A. program.

**ARTS601V Master of Fine Arts Exhibition (1-6) (FA, SP, SU)** 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.

**ARTS602V Graduate Drawing (1-6) (FA, SP, SU)** Individual problems in drawing techniques. May be repeated. Prerequisite: graduate standing.

**ARTS612V Graduate Painting (1-6) (FA, SP, SU)** Individual problems in painting techniques. May be repeated. Prerequisite: graduate standing.

**ARTS622V Graduate Sculpture (1-6) (FA, SP, SU)** Individual problems in sculpture techniques. May be repeated. Prerequisite: graduate standing.

**ARTS632V Graduate Design (1-6) (FA, SP, SU)** Individual problems in two and three dimensional design. May be repeated. Prerequisite: graduate standing.

**ARTS642V Graduate Printmaking (1-6) (FA, SP, SU)** Individual problems in printmaking techniques. May be repeated. Prerequisite: graduate standing.

**ARTS652V Graduate Ceramics (1-6) (FA, SP, SU)** Individual problems in ceramic techniques. May be repeated. Prerequisite: graduate standing.

**ARTS682V Graduate Photography (1-6) (FA, SP, SU)** Individual problems in photography. May be repeated. Prerequisite: graduate standing.

**ARTS692V Special Studio Problems (1-6) (FA, SP, SU)** Individual problems in studio areas on arranged basis. May be repeated. Prerequisite: graduate standing.

**ARTS695V Special Topics (1-6) (IR)** Subject matter not covered in other courses. May be repeated for 12 hours. Prerequisite: graduate standing.

**(ASTR) ASTRONOMY**

**ASTR2003 Survey of the Universe (FA, SP, SU)** An introduction to the content and fundamental properties of the cosmos. Topics include planets and other objects of the solar system, the Sun, normal stars and interstellar medium, birth and death of stars, neutron stars, pulsars, black holes, the Galaxy, clusters of galaxies, and cosmology.

**ASTR2003H Honors Survey of the Universe and Laboratory (FA, SP, SU)** An introduction to the content and fundamental properties of the cosmos. Topics include planets and other objects of the solar system, the sun, normal stars and interstellar medium, birth and death of stars, neutron stars, black

**ASTR2001L Survey of the Universe Laboratory (FA, SP, SU)** Daytime and nighttime observing with telescopes and indoor exercises on selected topics.

**ASTR2001M Survey of the Universe and Laboratory, Honors (FA, SP, SU)** An introduction to the content and fundamental properties of the cosmos. Topics include planets and other objects of the solar system, the sun, normal stars and interstellar medium, birth and death of stars, neutron stars, black

**ASTR301V Observational Astronomy (1-3) (FA, SP, SU)** Individual experimental or observational problems studied with small telescopes, cameras, and other basic equipment. No credit is given toward a B.S. degree in physics. Prerequisite: ASTR 2003 or ASTR 3003.

**ASTR3033 Solar System Astronomy (IR)** Basic course on state of knowledge of solar system astronomy, especially designed for students in B.A. Physics program or as an elective for undergraduates in related areas. Prerequisite: PHYS 2033 and PHYS 2031L.

**ASTR3053 Stellar System Astronomy (IR)** Basic course on stars, galaxies and cosmology; especially designed for students in the B.A. Physics program or as an elective for undergraduates in related areas. Prerequisite: PHYS 2033 and PHYS 2031L.

**ASTR4013 Astrophysics (FA, Odd years)** Introduction to astrophysics for seniors and graduate students. The course covers stellar evolution, interstellar medium, galactic nucleogenesis and observational cosmology. Prerequisite: PHYS 3614, CHEM 3504, or graduate standing.

**ASTR5033 Planetary Systems (FA)** The nature of the solar system and other planetary systems as deduced from observations and theoretical modeling. Structure and evolution of terrestrial and jovian planets and their satellites. Planetary atmospheres, magnetospheres, and the solar wind; planetary interiors. Theoretical and observed properties of exoplanetary systems; astrobiology.

**(BENG) BIOLOGICAL ENGINEERING**

**BENG1012 Biological Engineering Design Fundamentals I (FA)** (Formerly BAEG 1012, First offered Summer 2002). Introduction to the profession of Biological Engineering. Basic engineering methodologies, including analysis and design, as applied to biological systems. Introduction to problem solving and data analysis utilizing computers. Group activities and team design efforts. Lecture 1 hour, laboratory 3 hours per week. Corequisite: BENG 1010L.

**BENG1010L Biological Engineering Design Fundamentals I Laboratory (FA)** (Formerly BAEG 1010L, First offered Summer 2002). Corequisite: BENG 1012.

**BENG1022 Biological Engineering Design Fundamentals II (SP)** (Formerly BAEG 1022, First offered Summer 2002). Continuation of BENG 1012. Emphasis on applying computer tools to problem solving and engineering design with biological systems. Lecture 4 hours per week. Prerequisite: BENG 1012.

**BENG2103 Electronic Applications in Biological Systems (IR)** Basic circuit theory and introductory applications of DC circuits, AC circuits and electro-mechanical components in actuating, monitoring and controlling processes involving biological materials. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 2100L.

**BENG2100L Electronic Applications in Biological Systems Laboratory (IR)** Corequisite: BENG 2103.

**BENG2612 Quantitative Biological Engineering I (FA)** (Formerly BAEG 2612, First offered Summer 2002). A systems engineering approach to quantifying bio-energetics,

growth and the interface between organisms and the physical environment, including energy balances, mass balances, solar energy and psychrometrics. Initiation of two-semester team design project involving design of life support for an enclosed biological system, such as a growth chamber or bio-reactor. Pre- or Corequisite: PHYS 2054. Prerequisite: BIOL 1543 and BIOL 1541L and BENG 1022.

**BENG2622 Quantitative Biological Engineering II (SP)** (Formerly BAEG 2622, First offered Summer 2002). Continuation of BENG 2612. Introductory biological engineering design of life support systems that produce food, energy or other biological products. Completion of two-semester design project, including construction, testing and evaluation. Analysis using descriptive statistics, regression, engineering economics. Integrates social concerns, ethics, safety and aesthetics using soft systems concepts. Prerequisite: BENG 2612.

**BENG3712 Engineering Properties of Biological Materials (SP)** Measuring and predicting the physical, chemical, and thermal properties of biological materials necessary for the analysis and design of production and processing systems. Prerequisite: PHYS 2054.

**BENG3722 Biological Process Engineering I (FA)** Applications of the principles of microbial kinetics and heat transfer to the analysis and design of biological engineering processes. Biological engineering processes will encompass examples in the realms of food and bioprocess, bioenvironmental, biomechanical and biomedical engineering. Lecture 1 hour, laboratory 3 hours per week. Pre- or corequisite: MBIO 2013. Corequisite: BENG 3720L. Prerequisite: MEEG 2403 or CHEG 2313.

**BENG3720L Biological Process Engineering I Laboratory (FA)** Corequisite: BENG 3722.

**BENG3732 Biological Process Engineering II (SP)** Continuation of BAEG 3722. Continued applications of the principles of microbial kinetics and heat and mass transfer to the analysis and design of biological engineering processes such as food and bioprocess, bioenvironmental, biomechanical and biomedical engineering. Lecture 1 hour, laboratory 3 hours per week. Corequisite: BENG 3730L. Prerequisite: BENG 3722.

**BENG3730L Biological Process Engineering II Laboratory (SP)** Corequisite: BENG 3732.

**BENG3803 Mechanical Design in Biological Engineering (FA, SP)** (Formerly BAEG 3803, First offered Summer 2002). Engineering principles, selection, and design of mechanical components and systems for equipment used in biological, food and agricultural industry; combined stress analysis, materials, fasteners, power transmission and components, power hydraulics, pneumatics, atomization. Lecture 2 hours, laboratory 3 hours per week. Pre- or corequisite: MEEG 3013. Corequisite: BENG 3800L. Prerequisite: MEEG 2013.

**BENG3800L Mechanical Design in Biological Engineering Laboratory (FA, SP)** (Formerly BAEG 3800L, First offered Summer 2002). Corequisite: BENG 3803.

**BENG4103 Instrumentation in Biological Engineering (SP)** (Formerly BAEG 4103, First offered Summer 2002). Theory and advanced applications of analog circuits, digital circuits, and commercial instruments involving biological materials. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 4100L. Prerequisite: BENG 2103 (or ELEG 2103 or ELEG 3903).

**BENG4100L Instrumentation in Biological Engineering Laboratory (SP)** (Formerly BAEG 4100L, First Offered Summer 2002) Corequisite: BENG 4103.

**BENG4113 Risk Analysis for Biological Systems (FA, Odd years)** Principles of risk assessment including exposure assessment and dose response, and risk management. Methods of risk analysis modeling and simulation with computer software. Applications of risk analysis in animal, food and environmental systems. Prerequisite: MATH 2564 and MBIO 2013.

**BENG4123 Biosensors & Bioinstrumentation (SP)** Principles of biologically based sensing elements and interfacing techniques. Design and analysis methods of biosensing and transducing components in bioinstrumentation. Applications of biosensors and bioinstrumentation in bioprocessing, bioenvironmental, biomechanical and biomedical engineering. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 4120L. Prerequisite: MBIO 2013 and BENG 4103.

**BENG4120L Biosensors & Bioinstrumentation Laboratory (SP)** Corequisite: BENG 4123.

**BENG4203 Introduction to Biomedical Engineering (SP)** Engineering principles applied to the design and analysis of systems affecting human health. This is an

introductory course focusing on fundamentals of physiological systems and modeling and how this relates to analysis and equipment design. Topics include: brief overview of anatomy and physiology; biomedical sensors, instrumentation and signal processing; physiological modeling, biomechanics, and fluid mechanics. Lecture 3 hours per week. Prerequisite: MEEG 2013 (MEEG 2403 or CHEG 2313), ELEG 2103, (MEEG 3503 or CVEG 3213), MEEG 3013, BIOL 1543 or equivalents.

**BENG4213 Applications of Biomedical Engineering (FA)** Continuation of BENG 4203. Biomedical engineering fundamentals applied to biomedical engineering problems. Topics include: biomaterials, tissue engineering, biotechnology, radiation imaging, ultrasound, NMR, MRI, biomedical optics and lasers, rehabilitation engineering, assistive technology, and clinical engineering. Lecture 3 hours per week. Prerequisite: BENG 4203.

**BENG4403 Controlled-Environment Structures for Biological Systems (IR)** Environmental, structural and functional requirements of buildings, with emphasis on confinement systems for commercial animal and plant production. Analysis of heat and mass balances that incorporate physiological input of the organisms. Psychometrics and solar energy principles. Design of ventilation, heating and cooling systems. Simple structural design with wood components. Pre- or Corequisite: MEEG 3013. Corequisite: BENG 4400L. Prerequisite: MEEG 2403.

**BENG4400L Controlled-Environment Structures for Biological Systems (IR)** Corequisite: BENG 4403.

**BENG450V Special Problems (1-4) (FA, SP)** Selected problems in biological engineering are pursued in detail. Prerequisite: senior standing.

**BENG451VH Honors Thesis (1-6) (FA, SP, SU)** Prerequisite: Honors candidacy.

**BENG452V Special Topics in Biological Engineering (1-4) (IR)** Special topics in biological engineering not covered in other courses. May be repeated. May be repeated for 8 hours.

**BENG4623 Biological Reactor Systems Design (FA, Even years)** Extension of principles of microbial growth kinetics and transport phenomena to the design of biological reactor systems used in biological engineering. Reactor systems using specialty microbial biomass (activated sludge) for substrate utilization as well as biomass and product formation. Application areas such as bio-remediation, bioprocessing and organic (food/animal) waste treatment. Pre- or corequisite: CHEM 3813. Corequisite: BENG 4620L. Prerequisite: BENG 3732.

**BENG4620L Biological Reactor Systems Design Laboratory (FA, Even years)** Corequisite: BENG 4623.

**BENG4703 Food & Bioprocess Engineering (SP, Even years)** Basic engineering principles involved in the design of systems for handling, conditioning, and storage of agricultural materials. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 4700L. Prerequisite: BENG 3732 or CHEG 3143 or MEEG 4413.

**BENG4700L Food & Bioprocess Engineering Laboratory (SP, Even years)** (Formerly BAEG 4700L, First offered Summer 2002). Corequisite: BENG 4703.

**BENG4803 Precision Agriculture (FA, Odd years)** Introduction to precision agriculture, benefits, spatial variability within a field, zone concept, site-specific management. Spatial data collection: sensors, GPS, yield monitoring, remote sensing. Knowledge discovery from data: data processing, neural networks, genetic algorithms, use of GIS. Decision support systems. Variable-rate technology: real-time and map-based systems, variable-rate machinery, smart controls. Evaluation: Yield mapping, economic analysis. Prerequisite: MATH 1213 and basic computer skills, descriptive statistics.

**BENG4800L Precision Agriculture Laboratory (FA, Odd years)**

**BENG4813 Senior Biological Engineering Design I (FA)** (Formerly BAEG 4813, First offered Summer 2002). Design concepts for equipment and processes used in biological, food and agricultural industries. Initiation of comprehensive two-semester team-design projects; defining design objectives, developing functional/mechanical criteria, standards, reliability, safety, ethics and professionalism issues. Design mechanisms, solid modeling, consideration of vibrations using computer-aided techniques. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 4810L. Prerequisite: BENG 3803.

**BENG4810L Senior Biological Engineering Design I Laboratory (FA, Even years)** Corequisite: BENG 4813.

**BENG4822 Senior Biological Engineering Design**



**II (SP)** (Formerly BAEG 4822, First offered Summer 2002). Continuation of BENG 4813. Design concepts for equipment and processes used in biological and agricultural industries. Completion of 2-semester team design projects. Construction, testing, and evaluation of prototypes. Written and oral design reports. Discussion of manufacturing methods, safety, ergonomics, analysis/synthesis/design methods as appropriate for particular design projects. Laboratory/design 4 hours per week. Prerequisite: BENG 4813.

**BENG4903 Bioenvironmental Engineering (FA, Odd years)** (Formerly BAEG 4903, First offered Summer 2002). Engineering principles for the design of systems for utilization of surface water and ground water. Includes frequency analysis of rainfall, infiltration, runoff, evapotranspiration, hydraulic control structures, ground water pumping, drainage and irrigation. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 4900L. Prerequisite: CVEG 3213 or MEEG 3503.

**BENG4900L Bioenvironmental Engineering Laboratory (FA, Odd years)** (Formerly BAEG 4900L, First offered Summer 2002). Corequisite: BENG 4903.

**BENG4913 Bio-Environmental Engineering (SP, Even years)** Engineering principles for the design of systems for the biological treatment and utilization of organic by-products from animal and crop production and food and crop processing. Design of best management practices to protect bio-environmental resources by minimizing non-point pollution (off-site movement of sediment, nutrients and other constituents) and by minimizing nuisance odors associated with land applied organic residues, inorganic fertilizers and pesticides. Emphasis on economic utilization of beneficial components of typical wastes. Lecture 2 hours, laboratory 3 hours per week. Pre- or Corequisite: BENG 4903 or CVEG 3223. Corequisite: BENG 4910L.

**BENG4910L Bio-Environmental Engineering Laboratory (SP, Even years)** Corequisite: BENG 4913.

**BENG4923 Non-Point Source Pollution Engineering (SP, Odd years)** Engineering principles involved in assessment and management of nonpoint source (NPS) pollution. Effect of NPS pollution on ecosystem integrity. Use of GIS/mathematical models to quantify extent of pollution. Design/implementation of best management practices. Discussion of Total Maximum Daily Load (TMDL) principles and processes. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 4920L. Prerequisite: CVEG 3213 or MEEG 3503.

**BENG4920L Non-Point Source Pollution Engineering (SP, Odd years)** Corequisite: BENG 4923.

**BENG500V Advanced Topics in Biological Engineering (1-6) (FA, SP, SU)** (Formerly BAEG 500, First offered Summer 2002). Special problems in fundamental and applied research. Prerequisite: graduate standing.

**BENG5103 Advanced Instrumentation in Biological Engineering (SP, Even years)** Applications of advanced instrumentation in biological systems. Emphasis on updated sensing and transducing technologies, data acquisition and analytical instruments. Prerequisite: BENG 4103.

**BENG5100L Advanced Instrumentation Laboratory (SP, Even years)** Corequisite: BENG 5103.

**BENG5113 Agricultural Remote Sensing and GIS (FA, Even years)** Introduction to passive and active remote sensing, remote sensing systems, optical radiation models, sensor models, data models, spectral transforms, spatial transforms, correction and calibration, georectification, classification, vegetative indices. Introduction to GIS, spatial interpolation, spatial modeling. Applications in agriculture, variable rate technology, hydrologic modeling, yield monitoring, crop modeling. Prerequisite: GEOL 4413.

**BENG5110L Agricultural Remote Sensing and GIS Laboratory (FA, Even years)**

**BENG5123 Imaging and Rapid Analysis of Biological and Agricultural Materials (FA, Odd years)** Techniques of imaging and non-invasive analyses of biological and agricultural materials. Covering spectral sensing (x-ray, UV, VS, IR), optics, image processing, recognition, on-line monitoring and vision-based controls. Applications to automated food/fruit inspections, defect/contaminant detection, and characterization of food non-food materials in real-time on processing lines. Prerequisite: BENG 4103.

**BENG5613 Simulation Modeling of Biological Systems (FA, Even years)** Application of computer modeling and simulation of discrete 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 4023 or STAT 4003 or INEG 4333.

**BENG5703 Design and Analysis of Experiments for Engineering Research (IR)** 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. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 5700L. Prerequisite: INEG 4333.

**BENG5700L Design and Analysis of Experiments for Engineering Research Laboratory (IR)** Corequisite: BENG 5703

**BENG5713 Food Product and Process Development (FA, Odd years)** Multidisciplinary approaches for developing new food products and processes, in the context of an industry-sponsored project. Group dynamics and interpersonal skills. Factors that influence product and process development. Analysis and modeling applied to food process design. Lecture 1 hour, laboratory 6 hours per week. Corequisite: BENG 5710L. Prerequisite: BENG 4703.

**BENG5710L Food Product and Process Development Laboratory (FA, Odd years)** Corequisite: BENG 5713.

**BENG5723 Engineering Methods for Food Safety (FA, Even years)** Principles of engineering methods applied to food and safety and sanitation. Discussion of thermal, chemical, electrical pasteurization or sterilization in food processing. Demonstration of monitoring and detecting techniques for food safety, including image analysis, biosensors and modeling. Lecture 3 hours per week. Prerequisite: BENG 4103 and FDSC 4124 (or equivalent).

**BENG5733 Advanced Biological Process Engineering (FA, Odd years)** Applications of the principles of bioprocess/biochemical engineering to microbiological and biomedical problems. Topics include applied enzymology, metabolic engineering, molecular genetics and control, and bioinformatics in addition to classical applied enzyme and cell-growth kinetics and advanced bioreactor design. Prerequisite: BENG 3732 or CHEG 5531.

**BENG5801 Graduate Seminar (FA)** Reports presented by graduate students on topics dealing with current research in agricultural engineering. Prerequisite: graduate standing.

**BENG5903 Water Quality Modeling and Management (SP, Odd years)** Processes and methodologies associated with surface water quality modeling, investigation of management processes based on modeling results. Process from simple steady-state spreadsheet models (to understand aquatic biosystems modeling) to complex GIS-based dynamic models. Develop calibration and validation statistics for model applications. Students will develop a semester project that integrates their skills and knowledge in parameterizing, calibrating, and validating water quality models for environmental applications. Prerequisite: BENG 5613.

**BENG5913 Bioremediation and Biodegradation (SP, Odd years)** Environmentally-relevant biotechnology using organisms to remove or metabolize environmental pollutants through microbial degradation and phytoremediation of recalcitrant compounds. Benefits as well as potential costs of environmental applications of biotechnology will be evaluated.

**BENG5923 Nonpoint Source Pollution Control and Modeling (SP, Even years)** 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: BENG 4903 or CVEG 3223.

**BENG5933 Environmental and Ecological Risk Assessment (SP, Even years)** 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. Prerequisite: BENG 4113.

**BENG600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**BENG6713 Advanced Properties of Biological Materials (IR)** An advanced treatment of the physical, thermal, and electromagnetic properties of food and other biological materials. Special emphasis on the microscopic bases for physicochemical properties. Modeling of material properties and behavior. Lecture 2 hours, laboratory 3 hours per week. Corequisite: BENG 6710L. Prerequisite: graduate standing.

**BENG6710L Advanced Properties of Biological Materials Laboratory (IR)** Corequisite: BENG 6713.

**BENG700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (BIOL) BIOLOGY

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**BIOL1543 Principles of Biology (FA, SP, SU)** Principles that unify biology with emphasis on scientific study that demonstrates how all organisms are the product of evolution and are parts of interacting systems from the molecular to the ecosystem level. Corequisite: BIOL 1541L.

**BIOL1543H Honors Principles of Biology (FA, SP)** This course is designed for the well prepared student in Honors program. It focuses on the principles that unify the science of biology. Students will be exposed to how scientific principles have been used to demonstrate that all organisms are the products of evolution and are parts of interacting systems from the molecular to the ecosystem level. Corequisite: BIOL 1541M or BIOL 1541L.

**BIOL1541L Principles of Biology Laboratory (FA, SP, SU)** Experimental and observational techniques used in biology with emphasis on the acquisition and interpretation of results that illustrate major biological principles. Corequisite: BIOL 1543.

**BIOL1541M Honors Principles of Biology Laboratory (FA, SP)** This course is designed for the well prepared student in the Honors program. It focuses on teaching students experimental and observational techniques used in the science of biology. It emphasizes the acquisition and interpretation of results that illustrate the major principles of biology. Corequisite: BIOL 1543H or BIOL 1543.

**BIOL2001 Bibliographic Practicum (FA, SP)** A systematic survey of biological literature and bibliographic resources. Includes library exercises and the compiling of selected bibliographies.

**BIOL2533 Cell Biology (FA, SP)** Introduction to cell structure, cell processes, biological polymers, energetics, and diversity. An introduction to biochemistry and cell chemistry. Pre- or Corequisite: (CHEM 1123 and CHEM 1121L) or (CHEM 1223 and CHEM 1221L) or equivalent. Prerequisite: BIOL 1543 and BIOL 1541L.

**BIOL2531L Cell Biology Laboratory (FA, SP)** Introduction to methods and techniques used in Cell Biology research. Laboratory experiences to highlight topics covered in BIOL 2533. Pre- or Corequisite: BIOL 2533

**BIOL3023 Evolutionary Biology (FA)** An introduction to the mechanisms and patterns of evolutionary change. Seeks to develop logical, scientific skills and to apply them in understanding how life has Prerequisite: BIOL 1543 and BIOL 1541L.

**BIOL3323 General Genetics (SP)** Surveys of Mendelian, molecular, and population mechanisms of inheritance and gene expression in prokaryotes and eukaryotes. Lecture 3 hours per week. Prerequisite: BIOL 1543 and BIOL 1541L and CHEM 1123 and CHEM 1121L and (MATH 1203 or STAT 2023 or equivalent).

**BIOL3321L General Genetics Laboratory (SP)** Analysis of genetic problems and experiments with emphasis on "hands-on" experience with a variety of organisms. May require time outside laboratory period. Laboratory 3 hours per week. Pre- or Corequisite: BIOL 3323.

**BIOL3863 General Ecology (FA, SP)** Ecological principles and concepts; environmental factors and interactions that determine distribution and abundance of organisms. Prerequisite: 7 hours of biological science.

**BIOL3861L General Ecology Laboratory (FA)** Pre- or Corequisite: BIOL 3863.

**BIOL3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in biological sciences).

**BIOL399VH Honors Course (1-4) (FA, SP)** May be repeated. Prerequisite: junior standing.

**BIOL4234 Comparative Physiology (FA)**

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. Corequisite: BIOL 4230L. Prerequisite: (8 hours in biology or zoology) and CHEM 3613 and CHEM 3611L

**BIOL4230L Comparative Physiology Laboratory (FA)** Corequisite: BIOL 4234.

**BIOL4263 Cell Physiology (SP)** Covers cellular processes involved in growth, metabolism, transport, excitation, signalling and motility, with emphasis on function and regulation in eukaryotes, primarily animals. Lecture 3 hours. Prerequisite: BIOL 2533 and BIOL 2531L and CHEM 3813 and PHYS 2033.

**BIOL4261L Cell Physiology Laboratory (SP)** Laboratory demonstrations of cell processes involved in growth, metabolism, transport, excitation, signalling and motility. Laboratory 3 hours. Corequisite: BIOL 4263.

**BIOL4353 Ecological Genetics (FA, Odd years)** Analysis of the genetics of natural and laboratory populations with emphasis on the ecological bases of evolutionary change. Prerequisite: BIOL 3323 and BIOL 3321L and MATH 2554 and STAT 2023 or equivalent.

**BIOL4433 Principles of Evolution (FA, Even years)** 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 3321L and BIOL 3861L. Prerequisite: BIOL 3323 and BIOL 3863.

**BIOL4463 Physiological Ecology of Animals (SP, Odd years)** Interactions between environment, physiology, and properties of individuals and populations on both evolutionary and ecological scales. Prerequisite: BIOL 3863 and ZOO 4234 and ZOO 4230L.

**BIOL4503 Ecosystem Ecology (SP, Odd years)** Factors controlling ecosystem structure and function. Topics include paleoclimate and species migrations, current species alliances, biogeochemical cycles, and climate change and ecosystem stability. Prerequisite: BIOL 3864 and CHEM 1123 and CHEM 1121L.

**BIOL4513 Population Ecology (SP, Odd years)** Survey of theoretical and applied aspects of population processes stressing models of growth, interspecific interactions, and adaptation to physical and biotic environments. Prerequisite: BIOL 3864.

**BIOL4511L Population Ecology Laboratory (SP, Odd years)** Pre- or Corequisite: BIOL 4513.

**BIOL4523 Physiological Ecology of Plants (SP, Even years)** Effects of environmental factors on plant growth. Studies of light, temperature, soil, and soil moisture relationships will be emphasized. Prerequisite: BIOL 3864.

**BIOL4613 Primate Adaptation and Evolution (FA, SP, SU)** Introduction to the biology of the order Primates. This course considers the comparative anatomy, behavioral ecology and paleontology of our nearest living relatives. (Same as ANTH 4613) Prerequisite: (BIOL 1543 and BIOL 1541L) or ANTH 1013.

**BIOL4724 Protistology (FA, Odd years)** 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: BIOL 4720L.

**BIOL4720L Protistology Laboratory (FA, Odd years)** Corequisite: BIOL 4724.

**BIOL480V Special Problems (1-6) (FA, SP, SU)** For advanced students with adequate preparation. May be repeated.

**BIOL4824 Community Ecology (SP, Even years)** Survey of theoretical and applied aspects of community processes stressing structure, trophic dynamics, community interactions, and major community types. Corequisite: BIOL 4820L. Prerequisite: BIOL 3864.

**BIOL4820L Community Ecology Laboratory (SP, Even years)** Corequisite: BIOL 4824.

**BIOL485V Field Ecology (1-3) (SP, SU)** Project oriented approach employing current field and laboratory techniques, experimental design, and data analysis. Field trip is required.

**BIOL498V Senior Thesis (1-6) (FA, SP, SU)**

**BIOL499V prerequisite: senior standing. (1-4) (FA, SP, SU)** May be repeated for 8 hours. Prerequisite: senior standing.

**BIOL5001 Seminar in Biology (FA, SP)** Discussion of selected topics and review of current literature in any area

of the biological sciences. May be repeated for 2 hours.

**BIOL5101 Bibliographic Practicum (FA)** Systematic survey of biological resources available on CD-ROM, through electronic library on-line services, and on the Internet and World Wide Web. Prerequisite: senior or graduate standing.

**BIOL5263 Cell Physiology (SP)** Covers cellular processes involved in growth, metabolism, transport, excitation, signalling and motility, with emphasis on function and regulation in eukaryotes, primarily animals. Lecture 3 hours. Prerequisite: BIOL 2533 and BIOL 2531L and CHEM 3813 and PHYS 2033.

**BIOL5261L Cell Physiology Laboratory (SP)** Laboratory demonstrations of cell processes involved in growth, metabolism, transport, excitation, signalling and motility. Laboratory 3 hours. Pre- or Corequisite: BIOL 5263.

**BIOL529V Research in Physiology (1-6) (FA, SP, SU)**

**BIOL5334 Biochemical Genetics (SP)** 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: BIOL 5330L. Prerequisite: BIOL 3323 (or equivalent) and CHEM 3813 (or equivalent).

**BIOL5330L Biochemical Genetics Laboratory (SP)** Corequisite: BIOL 5334.

**BIOL5353 Ecological Genetics (FA, Odd years)** Analysis of the genetics of natural and laboratory populations with emphasis on the ecological bases of evolutionary change. Prerequisite: BIOL 3323 and BIOL 3321L and MATH 2554 and STAT 2023 or equivalent.

**BIOL539V Research in Genetics (1-6) (FA, SP, SU)**

**BIOL5423 Human Evolutionary Anatomy (IR)** Paleobiologists reconstruct past lifeways and systematic relationships of our ancestors using comparative studies of bony morphology and associated soft tissues. This course surveys methods and theories used to infer function and phylogeny, and details relevant aspects of the anatomy of humans, living great apes, and fossil human ancestors. (Same as ANTH 5423) Prerequisite: ANTH 1013 and BIOL 1543.

**BIOL5433 Principles of Evolution (FA, Even years)** 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 3321L and BIOL 3861L. Prerequisite: BIOL 3323 and BIOL 3863.

**BIOL5463 Physiological Ecology of Animals (SP, Odd years)** Interactions between environment, physiology, and properties of individuals and populations on both evolutionary and ecological scales. Prerequisite: BIOL 3863 and BIOL 4234 and BIOL 4230L.

**BIOL549V Research in Vertebrate Morphology (1-6) (FA, SP, SU)**

**BIOL5503 Ecosystem Ecology (SP, Odd years)** Factors controlling ecosystem structure and function. Topics include paleoclimate and species migrations, current species alliances, biogeochemical cycles, and climate change and ecosystem stability. Prerequisite: BIOL 3864.

**BIOL5513 Population Ecology (SP)** 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 3864.

**BIOL5511L Population Ecology Laboratory (SP)** Demonstration of the models and concepts from BIOL 5513. Pre- or Corequisite: BIOL 5513.

**BIOL5523 Physiological Ecology (SP, Even years)** Effects of environmental factors on plant growth. Studies of light, temperature, soil, and soil moisture relationships will be emphasized. Prerequisite: BIOL 3864.

**BIOL558V Research in Cell Biology (1-6) (FA, SP, SU)**

**BIOL559V Research in Embryology (1-6) (FA, SP, SU)**

**BIOL569V Research in Invertebrate Zoology (1-6) (FA, SP, SU)**

**BIOL579V Research in Vertebrate Zoology (1-6) (FA, SP, SU)**

**BIOL580V Research in Botany (1-6) (FA, SP, SU)**

**BIOL581V Research in Microbiology (1-6) (FA, SP, SU)**

**BIOL5844 Community Ecology (SP, Even years)** Survey of theoretical and applied aspects of community

processes stressing structure, trophic dynamics, community interactions, and major community types. Corequisite: BIOL 5840L. Prerequisite: BIOL 3864.

**BIOL5840L Community Ecology Laboratory (SP, Even years)** Corequisite: BIOL 5844.

**BIOL585V Field Ecology (1-3) (SP, SU)** Project-oriented approach employing current field and laboratory techniques, experimental design and data analysis. Field trip is required. May be repeated.

**BIOL589V Research in Field Zoology (1-6) (FA, SP, SU)**

**BIOL590V Special Topics in Botany (1-6) (FA, SP)** Consideration of new areas of botanical science not yet treated adequately in textbooks or in other courses. May be repeated for 6 hours. Prerequisite: 8 hours of biological sciences.

**BIOL591V Special Topics in Microbiology (1-6) (FA, SP)** Consideration of new areas of microbiological science not yet treated adequately in textbooks or in other sciences. May be repeated. Prerequisite: 8 hours of biological sciences.

**BIOL600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**BIOL700V Doctoral Dissertation (1-12) (FA, SP, SU)** Prerequisite: graduate standing.

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## (BLAW) BUSINESS LAW

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**BLAW2013 Legal Environment of Business (FA, SP, SU)** Introduction to the legal environment in which businesses operate. Topics covered in this survey course include: foundations of the American legal system, forms of doing business, employment and labor law, business production and sales, antitrust, and ethics.

**BLAW3033 Commercial Law (FA, SP)** A study of the laws applicable to commercial transactions. Topics covered include the common law of contracts, Articles Two (Sales) and Three (Commercial Paper) of the Uniform Commercial Code, secured transactions, suretyship, and bankruptcy. Prerequisite: BLAW 2013.

**BLAW3043 Law of Business Organization (FA, SP)** A study of the laws applicable to business organizations. Topics covered include partnerships, corporations, property rights, and the regulation of business, including antitrust and employment discrimination. Prerequisite: BLAW 2013.

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## (BOTY) BOTANY

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**BOTY1613 Plant Biology (FA, SP, SU)** Consideration of basic flowering plant structure, growth, development, physiology, genetics, ecology, and a brief survey of other plant groups. Lecture 3 hours per week. BOTY 1611L is recommended as a corequisite and both are required for partial fulfillment of the Fulbright College natural sciences requirement. Prerequisite: BIOL 1543 and BIOL 1541L.

**BOTY1611L Plant Biology Laboratory (FA, SP, SU)** Pre- or Corequisite: BOTY 1613.

**BOTY1611M Honors Plant Biology Laboratory (FA, SP, SU)** Pre- or Corequisite: BOTY 1613.

**BOTY2404 Survey of the Plant Kingdom (SP)** Structure, reproduction, and evolution of plant groups. Lecture 2 hours, laboratory or field work 4 hours per week. Corequisite: BOTY 2400L. Prerequisite: BOTY 1613 and BIOL 1541L.

**BOTY2400L Survey of the Plant Kingdom Laboratory (SP)** Corequisite: BOTY 2404.

**BOTY4104 Taxonomy of Flowering Plants (SP, SU)** 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. Corequisite: BOTY 4100L. Prerequisite: BOTY 1613 and BOTY 1611L and BIOL 1543 and BIOL 1541L.

**BOTY4100L Taxonomy of Flowering Plants Laboratory (SP, SU)** Corequisite: BOTY 4104.

**BOTY4304 Plant Physiology (FA)** Study of plant processes. Lecture 3 hours, laboratory 3 hours per week. Corequisite: BOTY 4300L. Prerequisite: BOTY 1613 and BOTY 1611L and BIOL 1543 and BIOL 1541L and general chemistry.

**BOTY4300L Plant Physiology Laboratory (FA)** Corequisite: BOTY 4304.



**BOTY4424 Mycology (FA)** Form and function of the fungi. Lecture 2 hours, laboratory 4 hours per week. Corequisite: BOTY 4420L. Prerequisite: BOTY 1613 and BOTY 1611L and BIOL 1543 and BIOL 1541L.

**BOTY4420L Mycology Laboratory (FA)** Corequisite: BOTY 4424.

**BOTY480V Special Problems (1-6) (FA, SP, SU)** May be repeated for 6 hours.

**BOTY5323 Plant Growth and Growth Substances (SP, Even years)** Concepts and techniques employed in the study of growth and development with emphasis on growth substances. Prerequisite: BOTY 4304 and organic chemistry.

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## (CDIS) COMMUNICATION DISORDERS

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**CDIS2253 Introduction to Communicative Disorders (FA, SP)** An introductory course that surveys the professional interests of speech-language pathology and audiology with specific attention to the general recognition and classification of disorders of speech, language, and hearing, and general trends in rehabilitation. Consideration given to the classroom teacher's involvement in communication disorders.

**CDIS3103 Introduction to Audiology (SP)** Introduction to the basic concepts for administering and interpreting hearing tests, including the anatomy and physiology of the auditory system, disorders of the ear, and techniques for administering and interpreting basic pure tone threshold tests.

**CDIS3124 Normal Phonology and Articulatory Process (FA)** Analysis of the English speech sounds as a basis for speech improvement; physiological positions and movements; acoustic qualities and transcription in the international phonetic alphabet. Corequisite: CDIS 3120L.

**CDIS3120L Phonetic Transcription Laboratory (FA)** Transcription of the international phonetic alphabet. Corequisite: CDIS 3124.

**CDIS3203 Articulation and Voice Disorders (SP)** A study of the definition, etiology, pathology, and treatment procedures of problems of speech articulation and phonation. Prerequisite: CDIS 3124 and CDIS 3213.

**CDIS3213 Anatomy of Physiology of the Speech and Hearing Mechanisms (FA)** Structure and function of the organic mechanisms responsible for speech, language, and audition.

**CDIS3223 Language Development in Children (SP)** Study of the nature of language behavior and of the typical development of speech and language functions for communicative purposes, with primary emphasis on the preschool and early school-age child. Prerequisite: CDIS 3124.

**CDIS3234 Introduction to Clinical Practice (FA, SP)** An introduction to the various aspects of clinical operations including technical and interpersonal relationship skills necessary for case management and a survey of professional standards. Corequisite: CDIS 3230L.

**CDIS3230L Clinical Observation Laboratory (FA, SP)** Directed observations of clinical assessment and treatment sessions. Corequisite: CDIS 3234.

**CDIS3923H Honors Colloquium (IR)** Treats a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in speech or dramatic art).

**CDIS399VH Honors Course (1-6) (IR)** May be repeated for 12 hours. Prerequisite: junior standing.

**CDIS4001 Clinical Practicum Junior (FA, SP)** Entry-level training in speech-language clinical practicum activities. This course is taken for satisfactory or unsatisfactory credit. Prerequisite: CDIS 2224 and CDIS 2220L and CDIS 3203 and CDIS 3223 and CDIS 3234 and CDIS 3230L plus satisfactory completion of specific program requirements for clinical practice.

**CDIS4103 Sign Language and Deafness (SP, SU)** 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.

**CDIS4133 Introduction to Aural Rehabilitation (FA)** 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. Prerequisite: CDIS 3103.

**CDIS4213 Introduction to Speech and Hearing Science (SP)** Study of the acoustic structure of oral speech and the auditory skills underlying speech perception. Prerequisite: CDIS 3203, CDIS 3213, CDIS 3124, and CDIS 3120L.

**CDIS4223 Language Disorders in Children (FA)** Study of disorders of language acquisition and usage in children and adolescents, with emphasis upon the nature, assessment, and treatment of such disorders. Prerequisite: CDIS 3223.

**CDIS4231 Clinical Practicum Senior (FA, SP)** Practicum activities in speech-language pathology. This course is taken for satisfactory or unsatisfactory credit. Prerequisite: CDIS 4001.

**CDIS4241 Clinical Practicum: Public Schools (FA, SP)** Practicum activities in speech-language disorders in a public school setting.

**CDIS4253 Neurological Bases of Communication (FA)** A study of the structures and functions of the central and peripheral nervous systems as they relate to human speech, language, and cognition. Prerequisite: CDIS 3213.

**CDIS4263 Advanced Audiology (FA)** 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. Prerequisite: CDIS 3103.

**CDIS4273 Communication Behavior and Aging (SP)** 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.

**CDIS428V Clinical Practicum: Hearing Disorders (1-3) (FA, SP, SU)** Practicum in audiology. Pre- or Corequisite: CDIS 4263.

**CDIS490V Special Problems (1-3) (FA, SP, SU)** Prerequisite: advanced standing.

**CDIS5102 Research Methodology in Communication Disorders (SU)** 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.

**CDIS5112 Seminar in Early Intervention (FA)** 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, and legislation mandating services. Prerequisite: CDIS 3223 or equivalent, and graduate standing.

**CDIS5122 Feeding and Swallowing Disorders (FA)** Study of the etiology, assessment, and remediation of feeding and swallowing disorders in children and adults. Prerequisite: CDIS 3213 or equivalent, and graduate standing.

**CDIS5121 Feeding and Swallowing Disorders Lab (FA)** Observation and interpretation of techniques used for assessment and remediation of feeding and swallowing disorders in children and adults. Corequisite: CDIS 5122. Prerequisite: CDIS 3213 and graduate standing.

**CDIS5132 Discourse Analysis and Treatment (SU)** Study of discourse behaviors and discourse analysis procedures appropriate for communicatively disordered children and adults, along with review of management approaches associated with impaired discourse performance. Prerequisite: previous course work in language process and disorders, and graduate standing.

**CDIS5152 TBI and Right-Hemisphere Disorders (FA)** Study of the speech and language disorders commonly resulting from traumatic brain injury and right hemisphere disorders. Prerequisite: CDIS 4253 or equivalent, and graduate standing.

**CDIS5163 Seminar in Language Topics (FA, SP, SU)** Study of selected topics in normal and disordered language acquisition and/or language use. Implications of current research are reviewed and applied to evaluation and management of language impairment(s). Prerequisite: graduate standing.

**CDIS5173 Survey of Disorders of Communication (SU)** Cause and therapeutic principles of speech disorders, including articulatory defects, voice disorders, stuttering and

defects due to hearing deficiency. Offered for non-majors in communicative disorders-not open to those who have had CDIS 2253. Prerequisite: graduate standing.

**CDIS5182 Clinical Assessment of Speech and Language Disorders (FA)** Study of the basic diagnostic procedures used in speech-language pathology. Emphasis is placed on criteria for test selection, techniques in test administration, and interpretation of test results. Prerequisite: graduate standing.

**CDIS5193 Seminar in Problems of Oral Communication (FA, SP, SU)** Investigation of research in selected problems of oral communication; recent developments in speech-language pathology and audiology; individual problems for investigation. Prerequisite: graduate standing.

**CDIS5214 Voice and Resonance Disorders (SU)** Study of disorders of phonation and resonance, including etiologies, diagnosis, and intervention strategies. Prerequisite: graduate standing.

**CDIS5222 Fluency Disorders (FA)** Speech disfluency, including theoretical etiological assumptions and management consideration. Prerequisite: graduate standing.

**CDIS5232 Seminar in Misarticulation (SP)** Etiology, diagnosis and treatment of disorders of speech articulation. Prerequisite: graduate standing.

**CDIS5243 Language Disorders in Adults (SP)** Symbolic communicative breakdown due to neurological trauma; focus on resultant receptive, central processing, and expressive linguistic disabilities, including etiology, neurology, diagnosis and treatment. Primary course emphasis is placed upon aphasia, although other neuropathologies of speech and language in adults are addressed. Prerequisite: graduate standing.

**CDIS5253 Motor Speech Disorders (SP)** 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: CDIS 4253 or equivalent, and graduate standing.

**CDIS528V Advanced Clinical Practicum: Speech-Language Disorders (1-6) (FA, SP, SU)** Practicum activities in speech-language pathology. Prerequisite: graduate standing.

**CDIS5293 Augmentative and Alternative Communication (FA)** 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.

**CDIS5381 Diagnostic Practicum (FA, SP, SU)** Practicum activities in speech-language assessment. Prerequisite: graduate standing.

**CDIS548V Off-Campus Practicum: Public School Site (1-6) (FA, SP)** Practicum activities in speech-language disorders in a public school setting. Prerequisite: graduate standing.

**CDIS558V Internship: Clinical Site (3-6) (FA, SP, SU)** 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 other required practicum courses.

**CDIS568V Off-Campus Practicum: Clinical Site (1-6) (FA, SP, SU)** Practicum activities in speech-language disorders in an off-campus clinical site. Prerequisite: graduate standing; completion of at least 2 semesters of CDIS 528V.

**CDIS578V Internship: Public School Site (3-6) (FA, SP, SU)** 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 other required practicum courses.

**CDIS590V Special Problems (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**CDIS600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

## (CEMB) CELL AND MOLECULAR BIOLOGY

**CEMB 590V Special Topics in Cell and Molecular Biology (1-6)** (FA, SP, SU) Consideration of new areas in Cell and Molecular Biology not yet treated adequately in textbooks or in other courses. This course may be repeated, provided subject matter is different for a maximum of 6 hours of credit.

**CEMB 5911 Seminar in Cell and Molecular Biology** (FA, SP) 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.

**CEMB 600V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**CEMB 700V Doctoral Dissertation (1-18)** (FA, SP, SU)

## (CENG) COMPUTER ENGINEERING

**CENG1113 Introduction to Computers** (FA, SP, SU) Introductory course for students majoring in computer science or computer engineering. Topics include Von Neumann architecture, data representation, high-level languages, looping, functions, and pointers. (Same as CSCE 1113) Pre- or Corequisite: CSCE 1111L or CENG 1111L.

**CENG1111L Introduction to Computers Laboratory** (FA, SP, SU) Laboratory experiences to accompany CENG 1113. (Same as CSCE 1111L) Corequisite: CENG 1113.

**CENG1123 Introduction to Programming** (FA, SP) Introductory course to programming. Topics include problem analysis and specification, design and test of programming solutions, tools, decomposition, abstraction, iteration and recursion, program I/O and files. Credit will be allowed for only one of CSCE 1023 and CENG 1123. (Same as CSCE 1123) Pre- or Corequisite: CENG 1121L. Prerequisite: CENG 1113.

**CENG1121L Introduction to Programming Laboratory** (FA, SP) Laboratory experiences to accompany CENG 1123. (Same as CSCE 1121L) Corequisite: CENG 1123.

**CENG1910L Intro to Computer Programming Lab** (FA, SP, SU) Corequisite: CENG 1913.

**CENG2113 Digital Techniques I** (FA, SP, SU) Introduction to the hardware aspects of digital computers, logic gates, flip-flops, registers, A/D and D/A conversion, and memories. A scheduled laboratory is required. Drill sessions will be required when this course is taught in the summer terms. Corequisite: CENG 2110L. Prerequisite: (CSCE 1123 or CENG 1123) and MATH 2103.

**CENG2110L Digital Techniques I Laboratory** (FA, SP, SU) Corequisite: CENG 2113.

**CENG2123 Digital Techniques II** (FA, SP, SU) Continuation of Digital Techniques I. Memory, ROM, RAM, I/O devices, microprocessors and computer buses, machine language programming, and telecommunications. A scheduled laboratory is required. Corequisite: CENG 2120L. Prerequisite: CENG 2113.

**CENG2120L Digital Techniques II Laboratory** (FA, SP, SU) Corequisite: CENG 2123.

**CENG2133 Assembler Language Programming** (FA, SP) Study of the connection between hardware and machine language and between assembler and high-level languages. Topics include internal data representation, instructions, memory and data, I/O, hardware control, and high-level language interfacing. (Same as CSCE 2133) Prerequisite: (CSCE 1123 or CENG 1123) and CENG 2113.

**CENG2143 Data Structures** (FA, SP) Applications of the element of data structures, arrays, linked lists, trees, stacks, and search techniques. (Same as CSCE 2143) Prerequisite: (CSCE 1123 or CENG 1123) and (MATH 2554 or MATH 2043).

**CENG3213 Computer Organization** (FA, SP) An introductory course in computer organization including topics in digital logic, digital systems, and memory structure. (Same as CSCE 3213) Prerequisite: CENG 2133 and CENG 2113.

**CENG3313 Algorithms** (FA, SP) 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. (Same as CSCE 3313) Prerequisite: (CENG 2143 or CSCE 2143) and MATH 2103 and (MATH 2564 or MATH 3103)

**CENG3943 Engineering Applications of Unix** (SP) Structure of UNIX file system, use of exec and fork, interprocess communication and record locking. Prerequisite: CENG 2143.

**CENG3953 Logic Synthesis-VHDL** (FA) Representation of digital signals in VHDL, VHDL design description, use of IEEE standard logic package, representation of numbers in VHDL, design of arithmetic circuits using VHDL, VHDL for combinational circuits, VHDL sequential statements for registers and counters, VHDL code for finite state machines. Prerequisite: CENG 2123.

**CENG4213 Introduction to Computer Architecture** (FA, SP, SU) Design of a single board computer including basic computer organization, memory subsystem design, peripheral interfacing, DMA control, interrupt control, and bus organization. Corequisite: CENG 4210D. Prerequisite: CENG 3213.

**CENG4223 Digital Circuit Testing and Testability** (FA) The complexity of digital circuits place on IC chips have significant impact on the cost of tooling such chips. Testing is performed to ensure that function/performance have not been altered during fabrication. This course introduces current test techniques for digital circuits and to design strategies used to enhance their testability. Prerequisite: CENG 2123.

**CENG4233 Low Power Digital Systems** (FA) The reduction of power consumption is rapidly becoming one of the key issues in digital system design. Traditionally, digital system design courses focused mainly 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. Prerequisite: CENG 2123.

**CENG4343 Programming Windows and the GUI** (FA, SP, SU) Introduction to the basic concepts of graphical user interface (GUI) programming using the Microsoft Windows environment. Discussion of design techniques relating to color, size, shape, location, font, etc. Real-world applications will be programmed using Visual Basic, C and C++. Prerequisite: CENG 2143 or CSCE 2143.

**CENG4353 CPLD/FPGA-Based System Design** (FA) 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. Prerequisite: CENG 2123.

**CENG4403 Control Systems** (FA, SP, SU) Mathematical models of control root-locus, and frequency-response design techniques. Special topics. (Same as ELEG 4403, MEEG 4213) Prerequisite: ELEG 3123.

**CENG4413 Operating Systems** (FA, SP) An introduction to operating systems including topics in system structures, process management, storage management files, distributed systems, and case studies. (Same as CSCE 4413) Prerequisite: CENG 3213 and CENG 2143.

**CENG4423 Computer Systems Analysis** (IR) Basic concepts of problem analysis, model design, and simulation experiments. Sigma is used and compared to high-level and other simulation languages. Corequisite: CENG 4420D. Prerequisite: CENG 3313 and INEG 3313 or STAT 3013.

**CENG4420D Computer Systems Analysis Drill** (FA, SP, SU) Corequisite: CENG 4423.

**CENG4513 Software Engineering** (FA, SP) A modern approach to the current techniques used in software design and development. This course emphasizes the use of modern software development tools, multi-module programming, and team design and engineering. (Same as CSCE 4513) Prerequisite: CENG 3313 or CSCE 3313.

**CENG4523 Data-Base Management** (FA, SP, SU) Data-base management systems, types of data-base languages, relational algebra, SQL, compression techniques, E-R diagramming, and applications programs. Drill sessions will be required when this course is taught in the summer term. Corequisite: CENG 2143.

**CENG4533 Object Oriented Programming and Design** (FA, SP, SU) In-depth coverage of the methods and techniques of object-oriented design and its applications to database and artificial intelligence. Prerequisite: CENG 2143 or CSCE 2143.

**CENG4571 Senior Design Project I** (FA, SP) (Formerly CENG 457) Students complete comprehensive design project during their final year of undergraduate studies. The project is done over 2 semesters in phases: design, formal proposal, implementation, and presentation. The projects include and require the integration of hardware,

software, and human factor elements and are developed to standard engineering specifications. Prerequisite: satisfactory completion of all required 3000 level and below courses in the major (including CENG, CSCE, and ELEG courses), and the completion of at least 6 hours of technical electives.

**CENG4753 Computer Networks** (FA, SP) Introduction to the basic concept of computer networking. PC & UNIX based networks will be covered. Both hardware & software for such systems will be installed. Topics include both theory of networking & practical hand-on experience with real-world networks. Prerequisite: CENG 2123 and CENG 4513.

**CENG4813 Computer Graphics** (FA, SP, SU) Introduction to computer graphics, software, and hardware. Includes graphic display units, the viewpoint, the window, graphic inputs and graphic outputs. Drill sessions will be required when this course is taught in the summer terms. Prerequisite: CSCE 2143 or CENG 2143.

**CENG4823 Advanced Computer Graphics and Animation** (IR) Advanced topics in the generation of computer graphics and animation imagery concentrating on non-procedural approaches. Topics include physical modeling, transformations, lighting models, and rendering algorithms. Theoretical issues include the graphics pipeline and rendering equation. Practical issues include the use of industry standard graphics libraries and rendering hardware and efficiency. Prerequisite: CENG 4813.

**CENG4883 Introduction to Image Processing** (FA, SP, SU) Introduction to the basic concepts of image processing; theory and applications. Covers digital methods of image restoration; reformation, extraction and analysis. Corequisite: CENG 4880D. Prerequisite: CENG 2143 and senior standing.

**CENG4880D Introduction to Image Processing Drill** (FA, SP, SU) Corequisite: CENG 4883.

**CENG490V Special Problems (1-3)** (FA, SP, SU) May be repeated for 6 hours. Prerequisite: senior standing.

**CENG4953 Minicomputer Applications** (FA, SP, SU) Structure, implementation, and application of minicomputer systems. Microcomputer hardware. Microprogramming. Minicomputer software technology. Design and evaluation of minicomputer systems. Prerequisite: CENG 2143 or CSCE 2143.

**CENG4973 Senior Design Project II** (FA, SP, SU) Students complete a comprehensive design project. The project is done over 2 semesters (1 hour in the first, 3 hours in the second) in phases: design, formal proposal, implementation, and presentation. The projects include and require the integration of hardware, software, and human factor elements and are developed to standard engineering specifications. Prerequisite: CENG 4571.

**CENG5003 Artificial Intelligence** (FA, SP, SU) Provides students with an introduction to the major subjects and techniques of artificial intelligence. Topics include: machine learning, computer vision, natural language understanding, and AI languages. (Same as ELEG 5103) Prerequisite: CENG 4513 and graduate standing.

**CENG5013 Topics in Computer Hardware** (FA, SP, SU) Advanced features of computer hardware. Topics include: memory design, input and output design, direct memory access techniques, and electro-optical signal conversion and EPROM applications. Corequisite: CENG 5010L. Prerequisite: CENG 4213.

**CENG5010L Topics in Computer Hardware Laboratory** (FA, SP, SU) Corequisite: CENG 5013.

**CENG5023 Software Engineering I** (FA, SP, SU) A study of design and development used in software and computer systems engineering. Topics include project planning, requirements analysis, software design fundamentals, quality assurance, and software testing and maintenance. Prerequisite: graduate standing.

**CENG5033 Software Engineering II** (SP) A study in software project design and management. The class defines and develops a semester project carrying out the planning, requirements analysis, software and systems design quality assurance, as well as software testing and maintenance. Prerequisite: CENG 5023.

**CENG5043 Real-Time Operating Systems** (FA, SP, SU) A study and implementation of a real-time operating system for process control applications using a single board 68000-based microprocessor system. Prerequisite: graduate standing.

**CENG5093 Fault-Tolerant System Design** (SP) (Formerly CSEG 5093) Fault-tolerance is concerned with making or recovering from the effects of faults in a digital system, once they have been detected. On-line fault detection is often required before the fault recovery process. This course will familiarize students with currently available



techniques for self-checking and fault-tolerant digital system design. Prerequisite: CENG 4223.

**CENG510V Special Problems (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**CENG5153 Real-Time Data Acquisition Systems** (FA, SP, SU) The theory and practice associated with taking measurements of the real world for use with computers. Sampling and data analysis techniques. Prerequisite: ELEG 3923.

**CENG5213 Interactive Computer Graphics** (FA, SP, SU) Basic concepts involved in the generation and display of computer graphics. Topics include graphics hardware, transformations, modeling, and device independent graphics. Prerequisite: working knowledge of a programming language.

**CENG5303 Parallel Programming** (FA, SP, SU) An analysis of parallel computer systems with respect to software engineering. Practical programming experience on pipelined, array, and multiprocessor computers. Credit can be earned in only one of these three courses. CSCE 5303 or CENG 5303 or ELEG 5913. Prerequisite: working knowledge of 'C' language and CENG 4413 or equivalent.

**CENG5333 Knowledge-Based Systems** (FA, SP, SU) Expert systems, structured knowledge representation, and rule-based inference systems.

**CENG5643 Computer Communications Networks** (FA, SP, SU) A study of various current data communication techniques used in the computer world. Concepts of digital communications theory as well as packets and protocols are studied. Prerequisite: CENG 4413.

**CENG5683 Image Processing** (FA, SP, SU) Concepts involved in the processing of digital images. Emphasis on image analysis, enhancement, and restoration. Both spatial and frequency domain approaches are presented. Prerequisite: working knowledge of statistics and a programming language.

**CENG5801 Seminar** (FA, SP, SU) Oral presentations given by graduate students on subjects dealing with current topics in computer science engineering. Prerequisite: graduate standing.

**CENG581V Master's Research Project and Report (1-6)** (FA, SP, SU) Required course for report option. Prerequisite: graduate standing.

**CENG5903 Advanced Computer Architecture** (IR) A study of advanced architectural techniques employed in modern, general-purpose computers with emphasis on uniprocessor systems, uniprocessor topics; support for instruction-level parallelism (branch prediction, multiple instruction issue, speculative execution, compiler optimizations for ILP), advanced memory system design, high-performance I/O. Multiprocessor topics: cache coherence protocols, memory consistency models, synchronization mechanisms. Prerequisite: CENG 4213.

**CENG5913 Advanced Compilers** (IR) Compiler issues are discussed with regards to contemporary languages and architectures. Such topics as flow analysis, optimization, code scheduling, parallelism, and memory use will be covered. Prerequisite: CSCE 5233.

**CENG5923 Research Topics in Computer Architecture** (FA, SP, SU) This course focuses on the design of new high performance central processing units (CPU'S). The design of superscalar, superpipelined, decoupled and multithreaded architectures will be covered. Course materials will be drawn from literature, and will represent the current state of the art. Prerequisite: CENG 4213.

**CENG5933 CAD Methods for VLSI** (FA, SP, SU) Introduction to computational methods for the design and implementation of computer aided design (CAD) tools for digital systems engineering. The underlying theory of the tools is emphasized in addition to their application. Prerequisite: proficiency using a modern high-level programming language and CENG 4213.

**CENG5943 Computer Arithmetic Circuits** (FA, SP, SU) 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. Pre- or Corequisite: CENG 4213 or equivalent and graduate standing.

**CENG5953 Real-time Systems** (FA, SP, SU) A study of real-time system design. The development of real-time systems will be examined from the standpoint of academia, government, and industry. Scheduling, operating systems, and architecture considerations are among other topics to be covered.

**CENG5963 Computer Systems Optimization** (FA, SP, SU) Design considerations and performance analysis of computer and communication systems modeling. Prerequisite: CENG 4513.

**CENG5973 Embedded Systems Design** (FA) A theoretical and practical study of computing systems embedded in mechanical, electrical and electronic controls such as those to control automobiles, airplanes, appliances, and communication systems. Prerequisite: graduate standing in CSCE.

**CENG5983 Application Specific Integrated Circuit Design** (FA) ASIC design is taught with emphasis on industrial preparation. Topics include ASIC technologies, design entry, simulation, and synthesis. Advanced design methods and techniques are studies for cell based and gate array ASICs. Prerequisite: CENG 3213 or ELEG 4943.

**CENG610V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**CENG700V Doctoral Dissertation (1-18)** (FA, SP, SU)

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## (CHEG) CHEMICAL ENGINEERING

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**CHEG1113 Introduction to Chemical Engineering** (FA, SU) Introduction to the field of chemical engineering. Industries, careers, and the curriculum are discussed. Basic chemical engineering terms, concepts, and calculations are presented. Mass balance calculations are performed and the application of computers to chemical engineering problems is introduced.

**CHEG1123 Introduction to Chemical Engineering II** (SP, SU) Multiple-reaction, multi-unit mass balances; vapor-liquid equilibrium, enthalpy balances; rate concepts; thermodynamics and equilibrium stage concepts; engineering economics; professionalism; ethics; computer applications; introduction to process simulation. Prerequisite: CHEG 1113 and CHEM 1103 (or CHEM 1123).

**CHEG1212L Chemical Engineering Laboratory I** (FA, SP) Experimental measurements of various physical properties and comparison with published values and theoretical predictions. Interpretation of results using graphical, numerical and statistical tools, and presentation of results in written technical reports and oral briefings. Corequisite: CHEG 1210D. Prerequisite: CHEM 1103 or CHEM 1123.

**CHEG1210D Lab I Drill** (FA, SP) Corequisite: CHEG 1212L.

**CHEG2133 Fluid Mechanics** (FA, SP, SU) Analysis and design of fluids handling equipment and systems. Application of the principles of fluid statics, fluid dynamics, compressible flow, etc. Prerequisite: MATH 2564 and (CHEG 1123 or junior standing).

**CHEG2313 Thermodynamics of Single-Component Systems** (FA, SP, SU) A detailed study of the thermodynamic "state principles," energy and entropy balances, and their application to the solution of problems involving single-component physical systems and processes. Prerequisite: CHEG 1123 or junior standing.

**CHEG3143 Heat Transport** (FA, SP) Application of the principles of conduction, convection and radiation to the analysis and design of chemical processing heat transfer equipment and systems such as double-pipe and shell-and-tube heat exchangers, multiple-effect evaporators, condensers, and boilers. Prerequisite: CHEG 2133 and CHEG 2313.

**CHEG3153 Non-Equil. Mass Transfer** (SP, SU) Fundamentals of chemical diffusional processes. Applications in chemical engineering design of stagewise and continuous separations. Prerequisite: CHEG 2133 and CHEG 3323.

**CHEG3221 Professional Practice Seminar** (FA, SP) Discussion and experimental exercises in interpersonal relations, communication skills (including formal oral and written reports), group dynamics, leadership, professionalism, and ethics. Prerequisite: CHEG 1212L.

**CHEG3232L Chemical Engineering Laboratory II** (FA, SP) Experimental investigations of fluid flow and heat transfer. Complete written reports are required. Pre- or Corequisite: CHEG 3143. Corequisite: CHEG 3230D. Prerequisite: CHEG 1212L and CHEG 3221.

**CHEG3230D Lab II Drill** (FA, SP) Corequisite: CHEG 3232L.

**CHEG3253 Chemical Engineering Computer Methods** (FA) Application of computer methods to

chemical engineering problems including a review of structured programming principles. Pre- or Corequisite: CHEG 3143 and CHEG 3323. Corequisite: CHEG 3250D.

**CHEG3250D Chemical Engineering Computer Methods Drill** (FA) Corequisite: CHEG 3253.

**CHEG3323 Thermodynamics of Multi-Component Systems** (FA, SP) The use of the state principle and energy and entropy balance developed in CHEG 2313 is extended to allow processes. Physical and chemical equilibrium processes are considered in detail. Prerequisite: CHEG 2313 and MATH 2574.

**CHEG3333 Chemical Engineering Reactor Design** (SP, SU) Principles of kinetics of homogeneous and heterogeneous reactions, catalysis, and reactor design with applications, drawn from industrial processes. Prerequisite: CHEG 3323.

**CHEG4163 Equil. Stage Mass Transfer** (FA) Applications of chemical engineering design to stagewise and continuous separations in systems approaching equilibrium. Prerequisite: CHEG 3323.

**CHEG4263 Environmental Experimental Methodology** (IR) Introduction to experimental design, environmental analytical method quality assurance of analytical measurements, sample collection and preservation. Laboratory work necessary to support a field scale tracer experiment will be required. Prerequisite: senior or graduate standing.

**CHEG4273 Corrosion Control** (SP) Qualitative and quantitative introduction to corrosion and its control. Application of the fundamentals of corrosion control in the process industries is emphasized. Prerequisite: CHEG 2313.

**CHEG4332L Chemical Engineering Laboratory III** (FA, SP, SU) Experimental investigations of heat and mass transfer. Special attention to attaining a high order of accuracy and to presenting results in complete written reports, with emphasis on quality rather than quantity work performed. Pre- or Corequisite: CHEG 3153 and CHEG 4163. Corequisite: CHEG 4330D. Prerequisite: CHEG 3323.

**CHEG4330D Lab III Drill** (FA, SP, SU) Corequisite: CHEG 4332L.

**CHEG4413 Chemical Engineering Design I** (FA, SP) Principles of cost estimation, profitability, economic analysis, and economic balances as practiced in the chemical process industries. Special emphasis on the solution of problems involving the combination of engineering principles and economics. Pre- or Corequisite: CHEG 4163. Prerequisite: ECON 2013 (or ECON 2143) and CHEG 3143 and CHEG 3153 and CHEG 3333.

**CHEG4423 Automatic Process Control** (SP) Application of mathematical modeling methods to the description of transient phenomena of interest to process engineers. Modes of control and principles of feedback control are introduced with applications to process engineering problems. Prerequisite: MATH 3404 and CHEG 3143.

**CHEG4443 Chemical Engineering Design II** (FA, SP) 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. Corequisite: CHEG 4440D. Prerequisite: CHEG 4413 and CHEG 4163.

**CHEG4440D Chemical Engineering Design II Drill** (FA, SP) Corequisite: CHEG 4443.

**CHEG4813 Chemical Process Safety** (FA) Application of chemical engineering principles to the study of safety, health, and loss prevention. Fires and explosions, hygiene, toxicology, hazard identification, and risk assessment in the chemical process industries. Prerequisite: senior standing.

**CHEG488V Senior Problems (1-6)** (FA, SP, SU) Prerequisite: senior standing.

**CHEG4913 Environmental Engineering Chemodynamics** (IR) The course focuses on the application of chemical engineering fundamentals to the understanding and solution of multimedia environmental pollution problems. It includes study of intra- and inter-phase environmental mass transport, equilibrium distribution of contaminant species between the geospheres: air, soil and water.

**CHEG5013 Membrane Separation and System Design** (SP) 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. Prerequisite: CHEG 3153.

**CHEG5033 Technical Administration (FA)** Means and methods of planning, conducting, supervising, coordinating, and financing research, development, and engineering activities. Prerequisite: senior or graduate standing.

**CHEG5113 Transport Processes I (SP)** Fundamental concepts and laws governing the transfer of momentum, mass, and heat. Prerequisite: CHEG 2313 (or equivalent) and MATH 3404.

**CHEG5133 Advanced Reactor Design (FA)** 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. Prerequisite: MATH 3404 and CHEG 3333.

**CHEG5213 Advanced Chemical Engineering Calculations (SP)** Developments of and solution of equations and mathematical models of chemical processes and mechanisms. Prerequisite: CHEG 3333 and CHEG 3253.

**CHEG5223 Petroleum Processing (IR)** Introduction to petroleum production, field processing, and transportation. Prerequisite: CHEG 4413.

**CHEG5273 Corrosion Control (SP)** Qualitative and quantitative introduction to corrosion and its control. Application of the fundamentals of corrosion control in the process industries is emphasized. Prerequisite: CHEG 2313.

**CHEG5313 Advanced Thermodynamics (FA)** Methods of statistical thermodynamics, the correlation of classical and statistical thermodynamics, and the theory of thermodynamics of continuous systems (non-equilibrium thermodynamics). Prerequisite: CHEG 3323.

**CHEG5353 Advanced Separations (SP)** Phase equilibrium in non-ideal and multicomponent systems, distillation and other methods of computation are included to cover the fundamentals of distillation, absorption, and extraction. Prerequisite: CHEG 4163.

**CHEG5403 Organic Technology (IR)** Major unit processes in the organic chemical field with emphasis on industrial applications including the thermodynamic, kinetic, and economic problems associated with the manufacturing and utilization of synthetic organic chemicals. Prerequisite: CHEM 3603 or CHEM 3613.

**CHEG5513 Biochemical Engineering Fundamentals (SP)** 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. Prerequisite: CHEG 3143.

**CHEG5523 Bioprocessing (FA)** An introduction to the design, development, and scale-up of bioprocesses for the production of chemicals by fermentation. Major topics include fermentation kinetics, reactor design, process scale-up, and product recovery. Prerequisite: CHEG 3333.

**CHEG5613 Microelectronics Fabrication and Materials (FA, Odd years)** Overview of microelectronics and semiconductors with emphasis placed on the manufacturing process rather than device physics. Topics include the various types of devices, the manufacturing flow, and criteria for materials selection. No prior knowledge of electronics is required. Prerequisite: ELEG 3903.

**CHEG5723 Heat Transfer (FA)** Mechanics of heat transfer, followed by a detailed mathematical treatment of heat transfer by conduction, convection, and radiation, singly and in combination, and the application of heat transfer to design problems. Prerequisite: CHEG 3143 and senior or graduate standing.

**CHEG5733 Polymer Theory and Practice (IR)** Theories and methods for converting monomers into polymers are presented. Topics include principles of polymer science, commercial processes, rheology, and fabrication. Prerequisite: CHEM 3603 or CHEM 3613.

**CHEG5753 Air Pollution (IR)** Fundamentals of air pollution causes, effects, and measurements, as well as control methods with application to current industrial problems. (Same as CVEG 5753) Prerequisite: graduate standing.

**CHEG5801 Graduate Seminar (FA, SP)** Oral presentation are given by master's candidates on a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: graduate standing.

**CHEG588V Special Problems (1-6) (FA, SP, SU)** Opportunity for individual study of an advanced chemical engineering problem not sufficiently comprehensive to be a

thesis. Prerequisite: graduate standing.

**CHEG600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**CHEG6123 Transport Processes II (FA)** Continuation of CHEG 5113.

**CHEG6203 Preparation of Research Proposals (FA, SP, SU)** Prerequisite: doctoral students only.

**CHEG6801 Graduate Seminar (FA, SP)** Oral presentations are given by doctoral students on a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: graduate standing.

**CHEG688V Special Topics in Chemical Engineering (1-3) (FA, SP, SU)** Advanced study of current Chemical Engineering topics not covered in other course. Prerequisite: doctoral students only.

**CHEG700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

## (CHEM) CHEMISTRY

**CHEM1023 Basic Chemistry for Health Sciences (FA, SP, SU)** For students in Associate Degree in Nursing (ADN) program and allied health fields. Basic concepts in general, inorganic and organic chemistry. Lecture 3 hours, recitation 1 hour per week. Pre- or Corequisite: CHEM 1021L.

**CHEM1021L Basic Chemistry for Health Sciences Laboratory (FA, SP, SU)** Laboratory exercises and practice applicable to Basic Chemistry. Meets 3 hours per week. Pre- or Corequisite: CHEM 1023.

**CHEM1053 Chemistry in the Modern World (SP)** The impact of chemical developments upon contemporary society. Chemical problems of ecological, environmental, nutritional, economic, and sociological concern. Designed for nonscience majors. Lecture 3 hours per week. Pre- or Corequisite: CHEM 1051L.

**CHEM1051L Chemistry in the Modern World Laboratory (SP)** Laboratory exercises appropriate to Chemistry in the Modern World. Meets 2 hours per week. Pre- or Corequisite: CHEM 1053.

**CHEM1074 Fundamentals of Chemistry (FA, SU)** Fundamental principles of chemistry for students majoring in Home Economics or Nursing. Lecture 4 hours, recitation 1 hour per week. Pre- or Corequisite: CHEM 1071L. Corequisite: CHEM 1070D.

**CHEM1071L Fundamentals of Chemistry Laboratory (FA, SU)** Laboratory exercises in principles and practices of Fundamental Chemistry. Meets 2 hours per week. Pre- or Corequisite: CHEM 1074.

**CHEM1070D Fundamentals of Chemistry Drill (FA, SU)** Corequisite: CHEM 1074.

**CHEM1103 University Chemistry I (FA, SU)** Survey of basic chemical principles designed as an introductory course for science, engineering or agriculture majors. Lecture 3 hours per week. Corequisite: CHEM 1100D. Prerequisite: satisfactory performance on the mathematics proficiency examination or MATH 1203. CHEM 1101L is recommended and is a co- or prerequisite for students who do not have credit for high school chemistry.

**CHEM1101L University of Chemistry I Laboratory (FA, SU)** Laboratory exercises illustrating qualitative concepts and laboratory techniques in chemistry. Meets 3 hours per week for 1 hour credit. Pre- or Corequisite: CHEM 1103.

**CHEM1100D University Chemistry I Drill (FA, SU)** Corequisite: CHEM 1103.

**CHEM1123 University Chemistry II (FA, SP, SU)** Presents the topics of periodicity, bonding, stoichiometry, thermodynamics, kinetics, and chemical equilibrium in detail. Lecture 3 hours per week. Upon successful completion of 1123 with a grade of "C" or better, credit for 1103 will also be given for students who passed the 1103 proficiency exam. Pre- or Corequisite: CHEM 1121L and MATH 1203 (or satisfactory performance on the mathematics proficiency examination). Corequisite: CHEM 1120D. Prerequisite: CHEM 1103 (or satisfactory performance on the chemistry proficiency examination).

**CHEM1123H Honors University Chemistry II (FA, SP)** Presents the topics of periodicity, bonding, stoichiometry, thermodynamics, kinetics, and chemical equilibrium in detail. Lecture 4 hours per week. Upon successful completion of 1123H, credit for 1103 will also be given for students who passed the 1103 proficiency exam. Pre- or Corequisite: CHEM 1121M (or MATH 1203 or satisfactory performance on the mathematics proficiency examination). Corequisite:

CHEM 1120D. Prerequisite: CHEM 1103 (or satisfactory performance on the chemistry proficiency examination).

**CHEM1121L University Chemistry II Laboratory (FA, SP, SU)** Quantitative laboratory with data interpretation and exercises covering the topics of stoichiometry, thermodynamics, kinetics, chemical equilibrium, and descriptive inorganic chemistry. Laboratory 3 hours per week. Upon successful completion of 1121 with a grade of "C" or better, credit for 1101 will also be given for students who passed the 1103 proficiency exam. Corequisite: CHEM 1123.

**CHEM1121M Honors University Chemistry II Laboratory (FA, SP)** Quantitative laboratory with data interpretation and exercises covering the topics of stoichiometry, thermodynamics, kinetics, chemical equilibrium, and descriptive inorganic chemistry. Designed for students in the honors programs. Laboratory 3 hours per week. Corequisite: CHEM 1123H.

**CHEM1120D University Chemistry II Drill (FA, SP, SU)** Corequisite: CHEM 1123.

**CHEM1213 Chemistry for Majors I (FA)** The first half of a two-semester course designed especially for students planning to major in chemistry or biochemistry. Students may not receive credit for both CHEM 1213 and CHEM 1103. Pre- or Corequisite: CHEM 1211L. Corequisite: CHEM 1210D.

**CHEM1211L Chemistry for Majors I Laboratory (FA)** Laboratory 3 hours per week. Students may not receive credit for both CHEM 1211L and CHEM 1101L. Corequisite: CHEM 1213.

**CHEM1210D Chemistry for Majors I Drill (FA)** Corequisite: CHEM 1213.

**CHEM1223 Chemistry for Majors II (SP)** The second half of a two-semester course designed especially for students planning to major in chemistry or biochemistry. Students may not receive credit for both CHEM 1223 and CHEM 1123. Pre- or Corequisite: CHEM 1221L. Corequisite: CHEM 1220D. Prerequisite: CHEM 1213 and CHEM 1211L (or CHEM 1103 and CHEM 1101L).

**CHEM1221L Chemistry for Majors II Laboratory (SP)** Laboratory 3 hours per week. Students may not receive credit for both CHEM 1221L and CHEM 1121L. Corequisite: CHEM 1223.

**CHEM1220D Chemistry for Majors II Drill (SP)**

**CHEM2262 Analytical Chemistry Lecture (FA, SP)** Principles of chemical separations and analysis by classical and instrumental methods. The role of chemical equilibrium in physical and biological systems. Primarily for students in agriculture, biological, and physical sciences. Lecture 2 hours per week. Prerequisite: CHEM 1123 and CHEM 1121L (or CHEM 1074 and CHEM 1071L) and MATH 1203.

**CHEM2272 Analytical Chemistry Laboratory (FA, SP)** Primarily for students in agricultural, biological, and physical sciences. Provides experience in the techniques of classical and instrumental methods of chemical separation and analysis. Laboratory 8 hours per week. Pre- or Corequisite: CHEM 2262. Prerequisite: CHEM 1123 and CHEM 1121L (or CHEM 1074 and CHEM 1071L) and MATH 1203.

**CHEM2613 Organic Physiological Chemistry (SP, SU)** Survey of organic chemistry necessary for understanding of biological systems, with some related physiological chemistry. Lecture 3 hours per week. Pre- or Corequisite: CHEM 2611L. Corequisite: CHEM 2610D. Prerequisite: CHEM 1123 and CHEM 1121L (or CHEM 1074 and CHEM 1071L).

**CHEM2611L Organic Physiological Chemistry Laboratory (SP, SU)** Laboratory 3 hours per week. Corequisite: CHEM 2613.

**CHEM2610D Organic Physiological Chemistry Drill (SP, SU)** Corequisite: CHEM 2613.

**CHEM3113 Intermediate Inorganic Chemistry (SP, Odd years)** Systematic description of the chemical elements and their compounds arranged in groups, according to the periodic system. Does not carry credit toward the major requirement for the B.S. degree in Chemistry. Prerequisite: CHEM 1123 and CHEM 1121L.

**CHEM3203 Forensic Chemistry (FA)** Survey of chemistry used in criminal investigations. Topics may include detection and identification of drugs, alcohol, toxins, explosives and gun powder residue. Chemical analysis of paint, ink, paper, soil, glass and fibers. Chemical detection of blood and fingerprints. Extraction of DNA from evidence, DNA fingerprinting. Prerequisite: CHEM 3613 (recommended) or CHEM 2613.

**CHEM3453 Elements of Physical Chemistry (FA)** Fundamental concepts of physical chemistry primarily for B.A. Chemistry majors and pre-professional and agriculture



students, presented with some recourse to calculus and with applications to life processes and biochemistry. Lecture 3 hours per week. B.A. chemistry majors must enroll in CHEM 3451L concurrently. Prerequisite: CHEM 2262 and CHEM 2272 and PHYS 2033 and PHYS 2031L and MATH 2554 (or MATH 2043).

**CHEM3451L Elements of Physical Chemistry Laboratory (FA)** Techniques of physical measurements of chemical systems; error analysis and report writing. Experiments in thermochemistry, kinetics, and measurement of properties of matter using a variety of techniques. Laboratory 4 hours per week. Corequisite: CHEM 3453.

**CHEM3504 Physical Chemistry (FA)** Introduction to atomic and molecular structure, kinetic theory of gases, and elementary statistical mechanisms. Lecture and recitation 4 hours per week. Pre- or Corequisite: MATH 2564. Prerequisite: CHEM 1123 and CHEM 1121L and PHYS 2074.

**CHEM3514 Physical Chemistry II (SP)** Chemical thermodynamics, phase equilibria, chemical equilibrium; introduction to the structure and properties of solution, liquid state and solid state; chemical kinetics. Lecture and recitation 4 hours per week. Prerequisite: CHEM 3504.

**CHEM3512L Physical Chemistry Laboratory (SP)** Experimental studies of molecular structure, thermochemistry, and chemical kinetics, and the determination of other physicochemical properties of matter. Laboratory 8 hours per week.

**CHEM3603 Organic Chemistry (FA, SU)** Lecture 3 hours per week. Primarily for non-majors and B.A. chemistry majors who do not take the CHEM 3703/3702L-3713/ 3712L sequence. Pre- or Corequisite: CHEM 3601L. Corequisite: CHEM 3600D. Prerequisite: CHEM 1123 and CHEM 1121L.

**CHEM3603H Honors Organic Chemistry I (FA, SU)** Corequisite: CHEM 3602M.

**CHEM3602M Honors Organic Chemistry I Laboratory (FA, SU)** Pre- or Corequisite: CHEM 3603H.

**CHEM3601L Organic Chemistry I Laboratory (FA, SU)** Laboratory exercises in organic chemistry. Meets 3 hours per week. Corequisite: CHEM 3603.

**CHEM3600D Organic Chemistry I Drill (FA, SU)** Corequisite: CHEM 3603.

**CHEM3600E Honors Organic Chemistry I Drill (FA, SU)** Corequisite: CHEM 3603 H.

**CHEM3613 Organic Chemistry II (SP, SU)** Lecture 3 hours per week. Primarily for non-majors and B.A. chemistry majors who do not take the CHEM 3703/3702L and 3713/ 3712L sequence. Pre- or Corequisite: CHEM 3611L. Corequisite: CHEM 3610D. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 3603 and CHEM 3601L.

**CHEM3613H Honors Organic Chemistry II (SP, SU)** Pre- or Corequisite: CHEM 3611M. Corequisite: CHEM 3610E. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 3603 and CHEM 3601L.

**CHEM3612M Honors Organic Chemistry II Laboratory (SP, SU)** Pre- or Corequisite: CHEM 3613H.

**CHEM3611L Organic Chemistry II Laboratory (SP, SU)** Laboratory exercise in organic chemistry. Meets 3 hours per week. Corequisite: CHEM 3613.

**CHEM3610D Organic Chemistry II Drill (SP, SU)** Corequisite: CHEM 3613.

**CHEM3610E Honors Organic Chemistry II Drill (SP, SU)** Corequisite: CHEM 3613H.

**CHEM3703 Organic Chemistry (FA)** Basic chemistry of the compounds of carbon. Primarily for B.S. and B.A. chemistry majors. Lecture 3 hours per week. Corequisite: CHEM 3700D and CHEM 3702L. Prerequisite: CHEM 1123 and CHEM 1121L.

**CHEM3702L Organic Chemistry Laboratory I (FA)** Introduction to basic techniques for separation, purification, and identification of organic compounds. Lecture-discussion 1 hour, laboratory 3 hours per week. Corequisite: CHEM 3703.

**CHEM3700D Organic Chemistry Drill (FA)** Corequisite: CHEM 3702L and CHEM 3703.

**CHEM3713 Organic Chemistry II (SP)** Basic chemistry of the compounds of carbon. Primarily for B.S. and B.A. chemistry majors. Lecture 3 hours per week. Pre- or Corequisite: CHEM 3712L. Corequisite: CHEM 3710D. Prerequisite: CHEM 1123 and CHEM 1121L.

**CHEM3712L Organic Chemistry II Laboratory (SP)** Continuation of CHEM 3702L and introduction to basic techniques of synthesis, isolation, and determination of structure and reactivity of organic compounds. Lecture-discussion and laboratory 8 hours per week. Corequisite: CHEM 3713. Prerequisite: CHEM 3702L.

**CHEM3710D Organic Chemistry II Drill (FA)** Corequisite: CHEM 3713.

**CHEM3813 Introduction to Biochemistry (FA, SU)** Primarily for students in the agricultural, biological, and related sciences. Survey of the fundamentals of biochemistry. Credit may not be applied to the minimum hourly requirements for a B.S. major in chemistry. Lecture 3 hours per week. Prerequisite: CHEM 3613 and CHEM 3611L (or CHEM 3713 and CHEM 3712L or CHEM 2613 and CHEM 2611L).

**CHEM3923H Honors Colloquium (IR)** Covers a special topic or issue. Offered as a part of the honors program. May be repeated. Prerequisite: honors candidacy (may not be restricted to candidacy in chemistry).

**CHEM4011H Honors Seminar (SP)** Research seminar for chemistry majors enrolled in the program. Enrollment is required each spring semester for honors students. Senior honors students must make one research presentation to graduate with honors. Prerequisite: junior standing.

**CHEM4043 Environmental Chemistry (SP, Even years)** Application of chemical principles and techniques to specific environmental problems, and the chemical interrelationships among these problems. Topics include the chemistry of fossil fuels, new energy sources, energy storage concepts, air pollution, mineral resources, solid wastes, water and waste water treatment, pesticides, and toxic materials. Does not carry graduate credit for chemistry majors. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 3613 and CHEM 3611L (or CHEM 3713 and CHEM 3712L) and CHEM 3514 (or CHEM 3453).

**CHEM4123 Advanced Inorganic Chemistry I (FA)** Reactions and properties of inorganic compounds from the standpoint of electronic structure and the periodic table. Emphasis on recent developments. Prerequisite: CHEM 3514.

**CHEM4213 Instrumental Analysis (SP)** Provides students, especially those in the agricultural, biological, and physical sciences, with an understanding of modern instrumental techniques of analysis. Lecture 3 hours per week. Prerequisite: CHEM 2262 and CHEM 2272 and CHEM 3613 and CHEM 3611L (or CHEM 3713 and CHEM 3712L) and CHEM 3514 (or CHEM 3453).

**CHEM4211L Instrumental Analysis Laboratory (SP)** Provides laboratory experience in parallel with the lecture material in CHEM 4213. Laboratory 3 hours per week. Pre- or Corequisite: CHEM 4213.

**CHEM4723 Experimental Methods in Organic and Inorganic Chemistry (FA)** Introduction to the application of synthetic and spectroscopic methods in organic and inorganic chemistry, including mass spectroscopy, nuclear magnetic resonance, ultraviolet-visible, and infrared spectroscopy. Other laboratory techniques applicable to chemical research will be included. Lecture 1 hour, laboratory 6 hours per week. chemistry students may not receive graduate credit for this course and CHEM 5753. Pre- or Corequisite: CHEM 4720L. Corequisite: CHEM 4720D. Prerequisite: CHEM 3613 and CHEM 3611L (or CHEM 3713 and CHEM 3712L) and CHEM 3504 and CHEM 3514.

**CHEM4720D Experimental Methods in Organic and Inorganic Chemistry Drill (FA)** Corequisite: CHEM 4723.

**CHEM4720L Experimental Methods in Organic and Inorganic Chemistry Laboratory (FA)** Corequisite: CHEM 4723.

**CHEM4853 Biochemical Techniques (SP)** Techniques for handling, purifying and analyzing enzymes, structural proteins, and nucleic acids. Lecture 1 hour, laboratory 6 hours per week. Pre- or Corequisite: CHEM 5813 or CHEM 3813.

**CHEM498V Senior Thesis (1-6) (FA, SP, SU)**

**CHEM500V Chemistry Research (1-4) (FA, SP, SU)** Research problems. May be repeated.

**CHEM5043 Chemical Business (IR)** This course is intended to introduce the topics of Value Creation and Business Strategy Development as applied to industrial chemistry. Topics in career development such as resume writing, company culture, etc. are included. Prerequisite: senior standing.

**CHEM5101 Introduction to Research (FA, SP, SU)** Introduces new graduate students to research opportunities and skills in chemistry and biochemistry. Meets 1 hour per week during which new students receive information from faculty regarding research programs in the department and training in the use of research support facilities available in the department.

**CHEM5143 Advanced Inorganic Chemistry II (IR)** Chemistry of metallic and non-metallic elements emphasizing

molecular structure, bonding and the classification of reactions. Emphasis on recent developments. Prerequisite: CHEM 4123.

**CHEM5153 Structural Chemistry (IR)** Determination of molecular structure by spectroscopic, diffraction, and other techniques. Illustrative examples will be chosen mainly from inorganic chemistry. Pre- or Corequisite: CHEM 3504 and CHEM 4123.

**CHEM520V Science Teachers Workshop (1-3) (IR)** A course emphasizing hands-on demonstrations and laboratory exercises for K-12th grade science teachers. Selected current topics from the areas of biochemistry, chemistry, and physical science are discussed in a lecture format; grade appropriate exercises and demonstrations illustrating these topics are presented in a laboratory setting. Course cannot be counted toward the requirements for the B.S., B.A. or any graduate degree in chemistry and biochemistry. May be repeated for 6 hours.

**CHEM5223 Chemical Instrumentation (SP, Odd years)** Use and application of operational amplifiers to chemical instrumentation; digital electronic microprocessor interfacing; software development and real-time data acquisition. Prerequisite: CHEM 4213 and PHYS 2074.

**CHEM5233 Chemical Separations (FA, Even years)** 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.

**CHEM5243 Electrochemical Methods of Analysis (SP, Even years)** Topics will include: diffusion, electron transfer kinetics, reversible and irreversible electrode processes, followed by a discussion of chronoamperometry, chronocoulometry, polarography, voltammetry and chronopotentiometry. Prerequisite: CHEM 4213 and MATH 2574.

**CHEM5253 Spectrochemical Methods of Analysis (FA, Odd years)** 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. Prerequisite: CHEM 4213.

**CHEM5263 Nuclear Chemistry (FA, Odd years)** Nuclear structure and properties, natural and artificial radioactivity, radioactive decay processes, nuclear reaction, interactions of radiation with matter. Prerequisite: CHEM 3514.

**CHEM5273 Cosmochemistry (SP, Odd years)** Laws of distribution of the chemical elements in nature, cosmic and terrestrial abundance of elements; origin and age of the earth, solar system, and the universe. Prerequisite: CHEM 3514.

**CHEM5453 Quantum Chemistry I (SP, Odd years)** Fundamental quantum theory: Hamiltonian formalism in classical mechanics, Schrodinger equation, operators, angular momentum, harmonic oscillator, barrier problems, rigid rotator, hydrogen atom, interaction of matter with radiation. Prerequisite: CHEM 3504. (Recommended: MATH 3404).

**CHEM5463 Quantum Chemistry II (SP, Even years)** Continuation of Quantum Chemistry I, Matrix formalism spin, atomic structure, the chemical bond, valence-bond, valence-bond method, molecular-orbital theory, symmetry, diatomic molecules, hybridization, conjugated systems; introduction to molecular spectroscopy, magnetic resonance, ligand-field theory, and theoretical techniques for molecular calculation. Prerequisite: CHEM 3514.

**CHEM5473 Chemical Kinetics (SP)** Theory and applications of the principles of kinetics to reactions between substances, both in the gaseous state and in solution. Prerequisite: CHEM 3514.

**CHEM5603 Theoretical Organic Chemistry (FA)** 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. Prerequisite: CHEM 3514 and CHEM 3713 and CHEM 3712L.

**CHEM5633 Organic Reactions (FA)** The more important types of organic reactions and their applications to various classes of compounds. Prerequisite: CHEM 3514 and CHEM 3713 and CHEM 3712L.

**CHEM5753 Physical Methods in Organic Chemistry (FA)** Interpretation of physical measurements of organic compounds in terms of molecular structure. Emphasis on spectroscopic methods (infrared, ultraviolet, magnet resonance, and mass spectra). Prerequisite: CHEM 3712L and CHEM 3713 and CHEM 3514.

**CHEM5813 Biochemistry I (FA)** 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 carbohydrate metabolism. Prerequisite: CHEM 3712L and CHEM 3713 (or CHEM 3613 and CHEM 3611L) and CHEM 3514 (or CHEM 3453 and CHEM 3451L).

**CHEM5843 Biochemistry II (SP)** A continuation of CHEM 5813 covering topics including biological membranes and bioenergetics, photosynthesis, lipids and lipid metabolism, nucleic acid structure and structure and synthesis, and molecular biology. Prerequisite: CHEM 5813.

**CHEM600V Master's Thesis (1-6) (FA, SP, SU)**  
Prerequisite: graduate standing.

**CHEM6011 Chemistry Seminar (FA, SP)** Members of the faculty, graduate and advanced students meet weekly for discussion of current chemical research. Weekly seminar sections are offered for the Departmental seminar and for divisional seminars in biochemistry and in analytical, inorganic, nuclear, organic, and physical chemistry. Chemistry graduate students register for the Departmental seminar section and one of the divisional seminar sections each semester they are in residence. Seminar credit does not count toward the minimum hourly requirements for any chemistry graduate degree. Prerequisite: CHEM 3514 and CHEM 3712L and CHEM 3713 and senior or graduate standing.

**CHEM619V Special Topics in Inorganic Chemistry (1-3) (IR)** Topics that 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. May be repeated.

**CHEM629V Special Topics in Analytical Chemistry (1-3) (IR)** 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, analytical cosmochemistry. May be repeated.

**CHEM649V Special Topics in Physical Chemistry (1-3) (IR)** Topics that have been covered in the past include advanced kinetics, solution chemistry, molecular spectra, nuclear magnetic resonance spectroscopy, and methods of theoretical chemistry. May be repeated.

**CHEM6633 Chemistry of Organic Natural Products (IR)** 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.

**CHEM6673 Organic Reaction Mechanisms (FA, Odd years)** A detailed description of the fundamental reactions and mechanisms of organic chemistry. Prerequisite: CHEM 5633.

**CHEM669V Special Topics in Organic Chemistry (1-3) (IR)** Topics that have been presented in the past include heterogeneous catalysis, isotope effect studies of organic reaction mechanisms, organometallic chemistry, stereochemistry, photochemistry, and carbanion chemistry. May be repeated.

**CHEM6823 Physical Biochemistry (FA, Even years)** 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 and CHEM 3514) or graduate standing.

**CHEM6863 Enzymes (FA, Odd years)** Isolation, characterization, and general chemical and biochemical properties of enzymes. Kinetics, mechanisms, and control of enzyme reactions. Prerequisite: graduate standing (or CHEM 5843 and CHEM 5813).

**CHEM6873 Molecular Biochemistry (SP, Odd years)** Nucleic acid chemistry in vitro and in vivo, synthesis of DNA and RNA, genetic diseases, cancer biochemistry, genetic engineering. Prerequisite: CHEM 5813 and CHEM 5843.

**CHEM6883 Bioenergetics and Biomembranes (SP, Even years)** Cellular energy metabolism, photosynthesis, membrane transport, properties of membrane proteins, and the application of thermodynamics to biological systems. Prerequisite: CHEM 5813 and CHEM 5843.

**CHEM700V Doctoral Dissertation (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

## (CHIN) CHINESE

### CHIN1003 Elementary Chinese I (FA)

**CHIN1013 Elementary Chinese II (SP)** Elementary courses stress correct pronunciation, Aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: CHIN 1003 or equivalent.

**CHIN2003 Intermediate Chinese I (FA)** Intermediate courses lead to greater facility in spoken language and to more advanced reading skills. Prerequisite: CHIN 1013 or equivalent.

**CHIN2013 Intermediate Chinese II (SP)** Continued development of basic speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: CHIN 2003 or equivalent.

**CHIN3003 Advanced Chinese (FA)** Continues to develop speaking, listening, reading and writing skills and presents more complex forms and structures of the language as well as additional characters. Prerequisite: CHIN 2013

**CHIN3033 Conversation (IR)** Guided conversation practice for the post-intermediate student. Prerequisite: CHIN 2013 or equivalent.

**CHIN3103 Chinese Culture and Film (SP)** A course based on film and readings designed to give insight into Chinese civilization and culture with special emphasis on ethnicity, modern history, contemporary society, education, language, customs, and visual arts. This course is taught in English. May be repeated for 6 hours.

**CHIN3983 Special Studies (IR)** May be offered in subject not specifically covered by courses otherwise listed. May be repeated for 6 hours.

## (CIED) CURRICULUM AND INSTRUCTION

**CIED0003 Developmental Reading (FA, SP, SU)** A structured individualized laboratory course in the improvement of reading skills. For students not meeting UA admissions reading placement standards. University credit given; does not count towards graduation.

**CIED1002 Introduction to Education (FA, SP, SU)** Integrates psychological, sociological, and philosophical foundations of education with concurrent involvement in field experiences. Encourages prospective teachers to become reflective practitioners by emphasizing organization of school systems, planning and implementation of effective classroom environments, development of teaching styles, and new directions in education. Corequisite: CIED 1011.

**CIED1011 Introduction to Education: Practicum (FA, SP, SU)** A 30-hour early field experience designed to give prospective teachers opportunities to observe and participate in a variety of school settings. Includes a variety of field-based activities to encourage personal reflection. Special focus upon organization of school systems, effective classroom environments teaching styles, and new directions in education. Corequisite: CIED 1002.

**CIED3023 Survey of Exceptionalities (FA, SP, SU)** A survey of the characteristics of students with exceptional needs. Reviews the definitions of exceptionalities, learning and behavior characteristics of individuals with exceptionalities, the legal basis for the education of persons with exceptionalities in both elementary and secondary schools. Prerequisite: CIED 1002 and CIED 1011.

**CIED3033 Classroom Learning Theory (FA, SP, SU)** A survey of the major theories of learning with special emphasis on human learning and implications for education. Prerequisite: CIED 1002 and CIED 1011 and PSYC 2003.

**CIED3043 Introduction to Middle Level Principles and Methods (FA)** A comprehensive overview of the key components, principles, methodologies, and research foundations to middle level education. Reflective activities and site-based field experience are integrated with course content to provide continuity between theory and practice. Portfolio expectations will be a primary means of course evaluation. Prerequisite: CIED 3052.

**CIED3053 The Emerging Adolescent (SP)** This course is a study of the developmental characteristics (social, emotional, physical, moral, and intellectual) of early adolescents (ages 10-15 years). The implications of these changes for motivation, instruction, learning, and classroom management in the classroom are emphasized. Course has field component. Corequisite: CIED 3033. Prerequisite: CIED 1011 and CIED 1002 and PSYC 2003 and CIED 3033.

### CIED3063 Literacy Strategies for Middle Level

**Learners (SP)** This course is designed to examine theories and practice regarding literacy development and assessment grounded in the knowledge of the characteristics of the middle level learner. A ten-hour field experience is required. Corequisite: CIED 3072. Prerequisite: CIED 3043.

**CIED3073 Early Adolescent Literature (SP)** A study of rationales and strategies for incorporating early adolescent literature across the middle level curriculum. Includes an examination of genres and selected texts from each. Corequisite: CIED 3063. Prerequisite: CIED 3043.

**CIED3103 Children's Literature (FA)** A survey of children's literary works, authors, and illustrators with emphasis on the preschool and primary grade literature. Corequisite: CIED 3113. Prerequisite: PSYC 3093.

**CIED3113 Emergent and Developmental Literacy (FA)** This course focuses on theories of children's emerging literacy and on the continuing development of literacy abilities in pre-kindergarten and early elementary years. Corequisite: CIED 3103. Prerequisite: PSYC 3033 or PSYC 3093.

**CIED3263 Language Development for the Educator (FA, SP)** Nature of speech-language development in preschool and school-aged children, including cognitive prerequisites, social contexts, and relationships between language acquisition and literacy. Language differences (dialectal, bilingual) and speech-language disorders are explored. The role of the educator in facilitating language acquisition is emphasized.

**CIED4101 Practicum (SP)** Practicum. Corequisite: CIED 4113 and CIED 4128.

**CIED4113 Integrated Communication Skills (SP)** Focuses on the methodology of facilitating pre-kindergarten, kindergarten, and early elementary children's literacy development. Emphasis is on the integration of the communication skills of reading, writing, speaking, and listening across the curriculum. Corequisite: CIED 4128 and CIED 4101. Prerequisite: PSYC 3093, CIED 3103, and CIED 3113.

**CIED4128 Content Integration (SP)** Integrates the curriculum and teaching strategies of mathematics, science, and social studies in childhood education. Students are required to develop a professional portfolio and participate in specified field experiences. Corequisite: PSYC 3093, CIED 3103, and CIED 3113.

**CIED4201 Seminar: Introduction to Professionalism (SP)** Examines the legal, ethical, and moral aspects of teaching and involvement in professional organizations. Students participate in field experiences, simulations, and discussions. Corequisite: CIED 4210 and CIED 4211 and CIED 4221.

**CIED4211 Seminar: Critical and Creative Thinking Skills (FA, SP, SU)** Provides a basic understanding of how to incorporate creative thinking skills across the curriculum. Students are introduced to a variety of strategies as well as site-based field experiences that provide continuity between theory and practice. Corequisite: CIED 4201 and CIED 4210 and CIED 4221.

**CIED4210 Practicum: Critical and Creative Thinking Skills (FA, SP, SU)** Practicum in which students apply theory to practice. Emphasis is on actual application of theory to their own creative and critical thinking skills, methods for transferring the knowledge of theory to classroom application in their curricular area(s), and curriculum development. Corequisite: CIED 4201 and CIED 4221.

**CIED4221 Seminar: Structure of the Disciplines (FA, SP, SU)** An analysis of the cognitive properties and organizations possible for subject disciplines. Looks at ways to discover understanding of a discipline and how to teach students to discover understanding. Corequisite: CIED 4201 and CIED 4210 and CIED 4211.

**CIED4323 Instructional Design for Teachers (FA, SP, SU)** Study of the design of instruction for students with exceptionalities. Emphasis is placed on synthesizing a broad range of existing and emerging perspectives and methods of instruction and applying them to practical classroom practice. Prerequisite: CIED 3023 and CIED 3303 and (CIED 3313 or CIED 3323).

**CIED4343 Teaching Reading (SP)** Focuses on teaching developmental and content area reading in the middle school, including strategies for expository text reading, process writing, literature-based instruction, and assessment of progress. Prerequisite: CIED 3103 and CIED 3113.

**CIED5003 Childhood Seminar (SP)** 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 young children. Professional attitudes, knowledge and skills applicable to today's early childhood educator are addressed. Prerequisite: admission to the CHED M.A.T.

**CIED5012 Measurement, Research, and Statistical Concepts for Teachers (SU)**

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.

**CIED5022 Classroom Management Concepts (FA)**

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.

**CIED5032 Curriculum Design Concepts for Teachers (SP)**

The design and adaptation of curriculum for students in regular and special 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.

**CIED5042 Reading and Writing Across the Curriculum (FA, SU)**

This course teaches the integration of reading and writing in the content areas. Reading and writing as integrated strands of the language process is 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 the M.A.T. program.

**CIED5052 Seminar: Multicultural Issues (SU)**

This seminar provides an introduction to the major concepts and issues related to multicultural education. The ways in which race, ethnicity, class, gender, and exceptionality influence students' behavior are discussed. Prerequisite: admission to the M.A.T. program.

**CIED5063 Contemporary and Futuristic Concerns of Childhood Education (SP)**

Historical, Contemporary and Future Perspective of Childhood Education. A problems course in childhood education that deals with historical, current and future concerns. These early childhood concerns include demographic trends, family composition and change, instructional models, social/political/economic issues, parent/community involvement, and evolving professional roles. Prerequisite: admission to the CHED M.A.T. program.

**CIED5073 Case Study in Childhood Education (SP)**

Provides the students with experience in conducting case studies related to childhood education. In addition, students gain knowledge regarding practices used in ethnographic research. Prerequisite: admission to M.A.T. program.

**CIED508V Childhood Education Cohort Teaching Internship (1-6) (FA, SP)**

May be repeated for 6 hours.

**CIED5093 Methods of Instruction for Middle Level I (SU)**

A study of methods and materials in the special content areas (math, science, English/language arts, and social studies). The planning of instruction, microteaching, and the development of middle school instructional materials are included. Prerequisite: admission to M.A.T. program.

**CIED5103 Advanced Middle Level Principles (SP)**

An in-depth examination of recent research on the major issues, practices, and policies for middle level education. Emphasis is on analysis of cutting edge issues germane to the life, education, and welfare of the early adolescent via the integration of theory and practice. Prerequisite: admission to Masters of Arts in Teaching program.

**CIED5113 Reading Across the Middle Level (FA, SP, SU)**

An overview of methods and materials for teaching reading to early adolescents. Reflective activities and site-based field experiences are integrated with course content to provide continuity between theory and practice. Portfolio expectations will be a primary means of course evaluation. Prerequisite: admission to the middle level education program and CIED 3113.

**CIED5123 Writing Process Across the Curriculum (Middle Level) (SP)**

(Formerly CIED 5124) This course will provide an overview of the research, and methods for incorporating writing across all curriculum. Writing as a process will be emphasized. Reflective activities and site-based field experience will be integrated into the course content. Prerequisite: admission to M.A.T. Program.

**CIED5132 Research in Middle Level Curriculum and Instruction (FA)**

An introduction to inquiry and research in middle level curriculum and instruction. It examines the principles, strategies, and techniques of research, especially qualitative inquiry. Practicum in educational research and evaluation is done as part of the class. Prerequisite: admission to the MAT program.

**CIED514V Internship: Middle Level (1-6) (FA, SP, SU)** The internship for middle level education is an extended field experience in which a preservice teacher integrates knowledge and skills developed in education classes with practice in the field. Prerequisite: admission to the M.A.T. program.

**CIED5153 Design and Preparation of Curriculum Materials (FA, SP, SU)**

(Formerly SEED 5153) Principles and procedures for the selection, development, and organization of curriculum materials including learning packages, simulation and gaming, units, courses of study or curriculum guides. Prerequisite: EDFD 5373 or equivalent.

**CIED5150 Middle School Practicum (FA, SP, SU)**

Provides practical experiences in conjunction with specified middle level course. Reflective activities and site-based field experiences are integrated with course content to provide continuity between theory and practice. Portfolio expectations will be a primary means of course evaluation. Prerequisite: enrollment is associated with middle level education courses.

**CIED5162 Applied Practicum (FA)**

Provides laboratory experiences for RDNG 5123 (Literacy Assessment) and RDNG 113 (Reading in Early Childhood Education). Corequisite: CIED 5183 and CIED 5173. Prerequisite: admission to the M.A.T. program.

**CIED5173 Literacy Assessment (FA)**

Focuses on assessment of young children's literacy skills. Techniques discussed include informal observation, miscue analysis, and portfolio assessment. Prerequisite: admission to the CHED M.A.T.

**CIED5183 Readings in Early Childhood Education (FA)**

Will continue to develop understandings of classic studies and will explore the impact these have had on the most recent issues in early childhood education. Prerequisite: admission to the CHED M.A.T.

**CIED5193 Methods of Instruction for Middle School II (FA)**

Second special methods course for teaching at the middle level. Emphasizes further refinement of teaching skills and methods; the integration of the sciences, mathematics, and technology; science, technology, and society (STS) issues; and the integration of social studies and English language arts. Prerequisite: CIED 5092 and admission to the M.A.T. program.

**CIED5221 The Moral Dimensions of Teaching (FA, SP, SU)**

Explores the moral aspects of the profession of teaching. In particular this course teaches about the valueladenness of teaching and presents methods to help prospective teachers adequately address moral and value issues. Prerequisite: admission to the M.A.T. program.

**CIED5232 Interdisciplinary Studies (FA, SP, SU)**

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.

**CIED5243 Special Methods of Instruction I (SU)**

Study of the method and materials in the special content areas. Includes philosophical, cognitive, and psychological dimensions of teaching the content area. The planning of instruction, microteaching, and the development of instructional materials are included. Prerequisite: admission to the M.A.T. program.

**CIED5253 Special Methods of Instruction II (FA)**

Study of the methods and materials in the special content areas. Classroom applications of teaching strategies with analysis of teacher effectiveness in seminar settings. Prerequisite: admission to the M.A.T. program.

**CIED5263 Measurement and Evaluation (FA, SP, SU)**

A study of measurement, testing, and evaluative procedures including types of tests, abuses of tests, test construction, scoring, analysis and interpretation, statistical methods, and alternative evaluation and assessment techniques. Prerequisite: admission to the M.A.T. program.

**CIED5262 Special Methods of Instruction III (SP)**

Study of the methods and materials in the special content areas. The focus is on student-centered and interdisciplinary teaching strategies. Extended content units are developed and implemented in the partnership school setting. Prerequisite: admission to the M.A.T. Program.

**CIED5273 Research in Curriculum and Instruction (FA, SP, SU)**

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. Prerequisite: admission to the M.A.T. program.

**CIED528V Secondary Cohort Teaching Internship (1-6) (FA, SP, SU)** May be repeated for 6 hours.

**CIED5293 Special Methods, Interdisciplinary Section (SP)**

The third and final part of the middle level special methods course. Provides interns with the knowledge, dispositions, and skills for developing interdisciplinary course of study in conjunction with the members of their interdisciplinary team. Prerequisite: CIED 5092 and CIED 5913 and admission to M.A.T. program.

**CIED5323 Transition Planning for Persons with Disabilities (SP)**

Prepares students to plan, evaluate, and implement transition programs within both regular and special classrooms at the elementary, middle and secondary school levels.

**CIED532V Practicum in Special Education (1-6) (IR)**

Supervised field experiences in special education programs, schools, institutions, and other facilities for exceptional children.

**CIED5343 Applied Classroom Management (FA)**

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 classroom management are addressed.

**CIED5373 Advanced Methods for Teaching Students with Exceptionalities (FA)**

An advanced course in designing and implementing individualized programs for students with exceptionalities. Students are provided practical experience in applying learning theories and instructional methodologies developed and observed in previous coursework. Prerequisite: acceptance into the SPED M.A.T. program.

**CIED5403 Early Childhood Education: Rationale and Curriculum (IR)** Rationale and curriculum of an early childhood education program, with special attention given curricular frameworks and professional organization policies.

**CIED5413 Early Childhood Education: Methods and Materials (IR)**

An interdisciplinary approach to methods and materials used in early childhood education with emphasis on developmental literacy. Prerequisite: PSYC 3093 and CIED 5403.

**CIED5423 Curriculum Reconstruction (FA, SP, SU)**

Changes in curriculum development and design as related to changing social/economic/political arenas. Theories of curriculum development, implementation and evaluation are researched.

**CIED5433 Children's Literature (FA, SP, SU)**

Issues and trends in children's literature. Contemporary works are evaluated and reviewed based on changing social political conditions. Multicultural approach to children's literature is emphasized. Prerequisite: undergraduate course in children's literature.

**CIED5453 Evaluation Techniques (IR)**

Evaluation of learning using traditional means of assessment as well as alternative or authentic assessment techniques.

**CIED5463 Child Behavior and Development (FA, SP, SU)**

Advanced study of research and theory. A thematic and case study approach to child behavior and development that investigates the child's behavior and needs in the school setting. Emphasis on current research. Prerequisite: PSYC 3093.

**CIED5473 Advanced Course in Children's Literature (IR)**

Compares and contrast contemporary award winning books with children's classics, analyzing elements of style. Focuses on use of rhetorical devices. Prerequisite: CIED 3103 and CIED 5433.

**CIED5483 Teaching Mathematics (IR)**

Content, methods, and materials for teaching multiple strands of elementary school mathematics. Emphasis on principles and procedures of a conceptual and integrated approach to learning mathematics. Prerequisite: undergrad coursework in teaching elementary or early childhood mathematics.

**CIED5493 Teaching Social Studies (IR)**

Purpose, content, psychology, materials, and methods for teaching the social sciences in the elementary school. Emphasis on principles and procedures for combining the social studies with other areas of the curriculum in broad unit instruction. Prerequisite: Undergraduate coursework in teaching elementary or early childhood social studies.

**CIED5503 Teaching Science (FA, SP, SU)**

The influence of science on the community, on the home, and the child. Use of science in the living and learning of the child at school.

**CIED5533 Teaching Language Arts (FA, SP, SU)**

The place of the language arts in the elementary curriculum. Exploration of materials, content, practices, and methods, used in reading, speaking, listening, and writing experiences.

**CIED5553 Problems in Elementary Education (FA,**

SP, SU) Problems, trends, and issues related to the elementary school.

**CIED5573 Teaching Reading** (FA, SP, SU) Teaching of reading to children; techniques, research, and modern practices.

**CIED5583 Correlates of Reading Process** (FA, SP, SU) The developmental program is emphasized through a student of the reading process. Learning theory and research are related to reading instruction and materials through the development and application of evaluative criteria based on an understanding of reading process. Prerequisite: CIED 5573.

**CIED5593 Corrective Reading in the Classroom** (FA, SP, SU) 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.

**CIED5603 Innovations in School Education** (FA, SP, SU) An examination of the change process in education with emphasis on those elements that support or hinder change in the schools, and the detailed study of schools innovations on national, state, and local levels.

**CIED5613 Contemporary Issues in Education** (FA, SP, SU) A study of issues pertaining to the goals, objectives, organization, and curriculum of the schools with an analysis of the teacher's role in dealing with current concerns in these areas.

**CIED5623 The School Curriculum** (FA, SP, SU) General principles and techniques of selecting and organizing curricular materials.

**CIED5633 Analysis of Instruction** (FA, SP, SU) A survey of the research and literature related to the systematic study of the field of teaching. An examination of the definitions of teaching and the knowledge base on which teaching is predicated. A study of the implications of the research of effective teaching and the key curricular and instructional issues.

**CIED5653 Methods of Middle School Instruction** (FA, SP, SU) Philosophy, rationale, and instructional practices of middle school instruction. Prerequisite: graduate standing.

**CIED5663 Evaluation of Instruction** (FA, SP, SU) Examination of methods and philosophies of evaluation. Consideration will be given to grading, techniques of grading, and construction of behavioral objectives and test items.

**CIED567V Teaching Foreign Cultures in Social Studies Curricula (1-6)** (FA, SP, SU) Extensive examination of foreign cultures (West Europe, USSR, China, Latin America) and methods of teaching about them in secondary school social studies.

**CIED5683 Adolescent Literature** (FA, SP, SU) Content course in adolescent literature including selection, reading, evaluation, and psychological basis of classic and contemporary works. Prerequisite: PSYC 3093 or equivalent.

**CIED5696 Interdisciplinary Instruction K-4** (FA, SP, SU) Stresses the learning of science, mathematics, and reading in grades K-4 as active, integrated constructive processes involving experimentation, investigation, communication, reasoning, and problem solving. Builds foundations in content to show connections and relevant applications of these disciplines.

**CIED5723 Nature and Needs of Persons with Mild Disabilities** (IR) Educational, psychological, and social characteristics of individuals who are mildly handicapped with emphasis on educational modifications. Prerequisite: CIED 3023.

**CIED5753 Nature and Needs of Persons with Serious Emotional Disorders** (IR) 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.

**CIED576V Teaching Severely Handicapped Children (1-6)** (IR) Methods and materials for teaching students with severe handicaps, including severe mental retardation, serious emotional disturbance, and severe physical disabilities.

**CIED5793 Corrective Reading Practicum** (FA, SP, SU) Laboratory experience in which students diagnose reading difficulties and practice remedial measures under the

direct supervision of the instructor. Emphasis is given to continuous diagnosis and to the use of commercially produced materials and trade books in remediation. Enrollment limited to 15. Prerequisite: CIED 5593.

**CIED5803 Nature and Needs of the Gifted and Talented** (FA) Educational, psychological, and social characteristics of gifted and talented children. Prerequisite: graduate standing.

**CIED5813 Curriculum Development in Gifted & Talented** (SP) Examines the various models for developing curriculum and providing services for students identified for gifted programs. Prerequisite: CIED 5803.

**CIED5823 Gifted and Talented (Structured) Practicum** (SU) Supervised field experience in gifted education programs, schools, institutions, and other facilities for gifted/talented children. Prerequisite: CIED 5813.

**CIED5833 Gifted and Talented (Flex) Practicum** (FA) Students design and implement an individualized practicum experience (Type III Renzulli) that provides the opportunity to refine and enhance personal attitudes, beliefs, and skills in gifted education. Prerequisite: CIED 5823.

**CIED5873 Assessment of Exceptional Students** (FA) Methods and techniques of assessment of children in all areas of exceptionality with emphasis on diagnosis and classification.

**CIED5883 Research in Special Education** (IR) Review of research in special education including all areas of exceptionality with emphasis on diagnosis and classification.

**CIED5893 Organization, Administration and Supervision of Special Education** (IR) Procedures, responsibilities and problems of organization, administration, and supervision of special education programs.

**CIED5903 Adaptive Instruction** (SU) An examination of the general principles and techniques for adapting instruction to meet the needs of various learning styles and learning modalities, especially those with exceptional strengths.

**CIED5913 Professionalization of Teaching** (FA, SP, SU) Explores the need for reconceptualizing the role and responsibility of career professional teachers and concomitant implications for school improvement and educational change. Reflection and inquiry processes are integrated with course content to increase congruence between theoretical bases and professional barriers. Prerequisite: experience as a practicing educator.

**CIED5923 Second Language Acquisition** (SP) 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.

**CIED5933 Second Language Methodologies** (FA) 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.

**CIED5943 Teaching People of Other Cultures** (FA) 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.

**CIED5953 Second Language Assessment** (SP) 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.

**CIED5963 Reading in Secondary Schools** (FA, SP, SU) Methods and materials of teaching reading in secondary schools with emphasis on remedial and developmental reading problems of students.

**CIED599V Special Topics (1-18)**

**CIED6013 Curriculum Development** (FA) 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.

**CIED6023 Instructional Theory** (IR) 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.

Prerequisite: EDFD 5373.

**CIED6033 Content Specific Pedagogy** (IR) 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. Prerequisite: CIED 6203.

**CIED6043 Analysis of Teacher Education** (IR) 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.

**CIED6073 Seminar in Developing Creativity** (IR) 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.

**CIED6083 Piaget's Theory and Instruction** (SP, Odd years) 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.

**CIED6103 Early Childhood Education Curriculum** (FA, SP, SU) Advanced course in curriculum design and evaluation for early childhood education programs. Prerequisite: CIED 5443.

**CIED6203 Individual Diagnosis and Remediation in Reading** (FA, SP, SU) Specialized techniques and material for diagnosis and remediation of reading disability. Rationale of the clinical setting is developed through emphasis on an interdisciplinary approach to diagnosis, program planning, and remediation. Enrollment limited to 20. Advanced graduate students only. Prerequisite: CIED 5583 and CIED 5593.

**CIED6223 Investigations in Reading** (FA, SP, SU) Research techniques and findings in reading are extensively reviewed by the student. Student is expected to culminate activity in this course by identifying a research problem in the field of reading for possible further study. Prerequisite: reading certification.

**CIED6233 Organization of Reading Programs** (FA, SP, SU) Study of the problem of organizing the classroom, individual school, and school system, for the improvement of reading instruction. Emphasis is given to the development of program organization rationale based on requirements of the teaching-learning setting.

**CIED6323 Science Seminar** (FA, SP, SU) Broaden the perspective of science educators who have the necessary background, knowledge, and skills to become effective professionals in higher education. Emphasis is on current trends in secondary science, issues developing in secondary science, research in science education, philosophy, and history of science education.

**CIED6403 Emerging Issues in Special Education** (IR) A study in the complex issues with which professionals in the field of special education must be familiar and prepared to address.

**CIED641V Special Topics in Special Education (1-6)** (IR) Discussion and advanced studies on select topics in special education. Specific focus on recent developments.

**CIED6423 Philosophical and Sociological Bases of Special Education** (IR) A study of the basic philosophical and sociological bases for current practices in special education. education.

**CIED6433 Legal Aspects of Special Education** (IR) A study of litigation and legislation in special education, federal and state laws and court cases, and due process hearings.

**CIED6443 Advanced Research in Special Education** (IR) A study in the planning, implementation, and evaluation of research in special education.

**CIED6503 Effective Teaching: Concepts and Processes** (FA, SP, SU) This course is designed to assist students in examining a variety of effective teaching practices and conditions found in classrooms and in acquiring knowledge, concepts, and ideas about ways to effectively influence the interests, learning and development of students. Prerequisite: admission to the Ph.D. program.

**CIED6603 Multicultural Education** (FA, SP, SU) 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 Ph.D. program.



**CIED660V Workshop (1-18)** (FA, SP, SU)

**CIED674V Internship (1-6)** (FA, SP, SU)

**CIED694V Special Topics (1-6)** (FA, SP, SU)

Discussion and advanced studies on selected topics in curriculum and instruction. Specific focus on recent developments.

**CIED695V Independent Study (1-6)** (FA, SP, SU)

**CIED699V Doctoral Seminar (1-3)** (FA, SP, SU)

**CIED700V Dissertation (1-18)** (FA, SP, SU)

Prerequisite: candidacy

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### (CLST) CLASSICAL STUDIES

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**CLST1003 Introduction to Classical Studies:**

**Greece** (FA, Odd years) An introduction to the world of Ancient Greece, from the Trojan War to Alexander the Great. Progresses chronologically, focusing on the literary, artistic, political, and philosophical ideas of the Greeks. Who were they and how are we like them? This course fulfills the second semester world literature requirement.

**CLST1003H Honors Introduction to Classical Studies: Greece** (FA, SP, SU)

**CLST1013 Introduction to Classical Studies:**

**Rome** (SP, Even years) A multifaceted introduction to Roman culture, focusing on literature, philosophy, architecture, history, art and archeology. Source material to be read in English. Lectures liberally illustrated with slides. This course fulfills the second semester world literature requirement.

**CLST1013H Honors Introduction to Classical Studies: Rome** (FA, SP, SU)

**CLST399VH Honors Course (1-6)** (IR) May be repeated for 12 hours. Prerequisite: junior standing.

**CLST4003H Honors Classical Studies Colloquium** (SP) Prerequisite: junior standing.

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### (CMJS) CRIMINAL JUSTICE

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**CMJS2003 Introduction to Criminal Justice** (FA, SP) Survey of the field of criminal justice, with an emphasis upon law enforcement, the courts, and corrections.

**CMJS2053 Critical Thinking and Writing in Criminal Justice** (FA, SP) An introduction to methods of critical thinking and writing in criminal justice. Prerequisite: CMJS 2003; open to majors only.

**CMJS3003 Criminal Law and Society** (FA, SP) Principles and problems of criminal law in contemporary society. Prerequisite: CMJS 2003.

**CMJS3023 Criminology** (FA, SP, SU) A survey of theories of crime causation, development of law, corrections, victimization, and police and policy. (Same as SOCI 3023) Prerequisite: SOCI 2013 or SOCI 2033.

**CMJS3043 The Police and Society** (FA, SP) Origins, development, and practice of policing, with an emphasis on police organization, problems, and issues in contemporary society. Prerequisite: CMJS 2003.

**CMJS3203 Corrections** (FA) A study of the origins, development, and practices related to corrections, including incarceration, community corrections and supervision, and intermediate sanctions. (Same as SOCI 3203) Prerequisite: CMJS 2003.

**CMJS3503 Criminal Procedures** (FA) Legal principles of police work, including arrests, force, interviewing, search and seizure. Prerequisite: CMJS 2003.

**CMJS3523 Criminal Investigation** (SP) Survey of the theories, concepts, and legal conditions concerning the techniques used in the location, preservation and presentation of evidence.

**CMJS399VH Honors Course (1-6)** (FA, SP) May be repeated for 12 hours.

**CMJS4003 Internship in Criminal Justice** (SP, SU) (Formerly CMJS 4006) Supervised experience in municipal, county or state criminal justice agency, or any other agency that is approved by instructor. Prerequisite: CMJS 2003.

**CMJS4013 Special Topics in Criminal Justice** (FA, SP) (Formerly CMJS 401) Comprehensive study of varied subjects in contemporary criminal justice. May be repeated for different topics. May be repeated for 9 hours. Prerequisite: CMJS 2003 or SOCI 2013.

**CMJS403V Individual Study in Criminal Justice (1-3)** (FA, SP, SU) A reading and conference course on special topics in criminal justice.

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### (CNED) COUNSELOR EDUCATION

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**CNED1002 Life Skills Development** (FA, SP, SU)

Study and practice of problem solving, decision making, goals and values clarification and other developmental skills affecting personal issues and academic success.

**CNED1011 Seminar** (FA, SP, SU) Single topic seminar

focusing on further knowledge acquisition, and training in specific developmental skills. Topics offered as needed. May be repeated for 3 hours.

**CNED2013 Paraprofessional Counseling and Leadership Development** (FA, SU)

Study and application of interpersonal and leadership skills. Conceptualization, observation and analysis of communications. Practice in developing direct and effective communications, particularly in peer counseling and leadership situations. Prerequisite: sophomore standing.

**CNED3053 The Helping Relationship** (FA, SP, SU)

An examination of school and community resources available to help students in distress. Development of an understanding of the helping relationship, including problem recognition and referral to appropriate resources. Particularly appropriate for students working as paraprofessional helpers, such as Residence Hall Staff, Orientation Counselors, or Study Skills Leaders. Prerequisite: PSYC 2003.

**CNED4003 Classroom Human Relations Skills**

(FA, SP, SU) A study of interpersonal skills important to improving teacher-student relationships and achievement in classrooms. Human communication systems related to motivation, achievement, and educator-student relationships are studied. The attainment of effective human relations skills are emphasized.

**CNED5203 Foundations of the Counseling Profession** (FA, SP)

A study of the counseling profession applicable to school 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.

**CNED5213 Lifestyle & Career Development** (FA, SP, SU)

Theories of career development and counseling, including the use of occupational information sources and career assessment tools and techniques.

**CNED5303 Individual Appraisal** (FA, SU) Analysis of concepts, methods, and procedures utilized in individual appraisal.

**CNED5313 Program Organization and Information Management** (SU)

Study of client information needs and strategies for effective management of counseling services.

**CNED5323 Counseling Theory** (FA, SP, SU)

Introductory survey and critical analysis of major alternative theoretical perspectives in counseling.

**CNED5333 Basic Counseling Techniques** (FA, SP, SU)

Introduction to basic counseling techniques and skills common to multiple theoretical perspectives.

**CNED5343 Counseling Practicum** (FA, SP, SU)

Supervised counseling practice. Prerequisite: CNED 5333 and CNED 5323.

**CNED5363 Dynamics of Group Counseling** (FA, SU)

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.

**CNED5373 Ethical and Legal Issues in Counseling** (FA, SP, SU)

(Formerly CNED 5372) 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 5103 and CNED 5203.

**CNED5383 Crisis Intervention Counseling** (FA, SP, SU)

(Formerly CNED 5382) 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 and CNED 5323.

**CNED5403 Case Management and Counseling**

(IR) 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 and CNED 5323 and CNED 5333.

**CNED5513 Counseling and Human Diversity** (FA, SP, SU) 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.

**CNED574V Counseling Internship (1-3)** (FA, SP, SU)

A 300-clock-hour field placement in an approved setting. May be repeated for 6 hours. Prerequisite: CNED 5323 and CNED 5333 and CNED 5343 and CNED 5363 and CNED 5372.

**CNED599V Seminar (1-18)** (IR)

**CNED6003 Counseling and Addictions** (FA, SP, SU) A study of behavioral and substance additions, including an overview of differential treatment. Prerequisite: CNED 5323 and CNED 5333.

**CNED600V Master's Thesis (1-6)** (FA, SP, SU)

**CNED6013 Advanced Counseling Theory and Methods** (FA, SP, SU) Critical analysis of major theoretical perspectives in counseling, including both group and individual counseling strategies for dealing with affective, cognitive, and behavioral dysfunction.

**CNED6023 Foundations of Marriage and Family Counseling Therapy** (FA)

Comprehensive exploration of the current theories/techniques of marriage, family and couples counseling. Prerequisite: CNED 5323 and CNED 5333.

**CNED6033 Advanced Group Theory and Methods**

(SP) 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.

**CNED6043 Supervision of Counselors** (FA, SP, SU)

Analysis, assessment, and practical application of counselor supervision techniques in treatment and training programs. Prerequisite: CNED 674.

**CNED605V Independent Study (1-18)** (FA, SP, SU)

**CNED6063 Counseling and Sexuality** (FA, SP, SU) Analysis of theory and practice in issues related to sexual dysphoria, sexuality, and sexual problems. Prerequisite: CNED 574.

**CNED6073 Research in Counseling** (FA, SP, SU)

(Formerly CNED 6072) Review and analysis of research in counseling.

**CNED6083 Consultation Theory and Methods**

(FA, SP, SU) Strategies, practical application, and techniques for effective consultation with parents, teachers, and community agencies.

**CNED6093 Counseling Children and Adolescents**

(FA, SP, SU) Introduction to counseling children and adolescents including the process, theories, techniques, and materials applicable to children and adolescents in a pluralistic society. Prerequisite: CNED 5323 and CNED 5333 and CNED 5343.

**CNED6123 Clinical Applications of Marriage and Family Counseling and Therapy (IR)**

Advanced clinical methodology appropriate for family counseling, marriage counseling, and couples counseling, in all settings, with emphasis on solution-focused systems, Satir model, and psychoeducational family work in schools. Includes supervision of clinical experience in marriage, family and couples counseling, video recording and school/community outreach. Prerequisite: doctoral or Advanced Master's standing. (CNED 6023 or equivalent).

**CNED6343 Cultural Foundations and Counseling**

(FA, SP, SU) Study of the effects of culture on case analysis and implications for treatment.

**CNED6413 Advanced Individual Appraisal** (FA, SP, SU)

To provide advanced knowledge and experience with those psychoeducational instruments and procedures used in conducting school related assessment. Prerequisite: CNED 5303 and CNED 5413 or equivalent.

**CNED6523 Gender Issues in Counseling and Human Development** (FA, SP, SU)

A study of gender and sex role issues pertinent to the counseling profession, and their effect on the development of children, adults, and young and older adults. Students utilize Gender Fair Guidelines for counseling as presented by the American Counseling Association. Prerequisite: CNED 5203.

**CNED674V Internship (1-9)** (IR)

Supervised field placement consent required.

**CNED680V Educational Specialist Project (1-6)**

(FA, SP, SU) An original project, research paper, or report required of all Ed.S. degree candidates. Prerequisite: admission to the Ed.S. program.

**CNED699V Seminar (1-18)** (FA, SP, SU) Prerequisite: advanced graduate standing.

**CNED700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

## (COMM) COMMUNICATION

**COMM1003 Basic Course in the Arts: Film Lecture** (FA, SP, SU) Introduction to film as entertainment and art. How to look at film through a study of composition, lighting, editing, sound, acting. Lectures and viewing time.

**COMM1003H Honors Basic Course in the Arts: Film Lecture** (FA, SP, SU) Introduction of film as entertainment and art. How to look at a film through a study of composition, lighting, editing, sound, acting. Lectures and viewing time.

**COMM1313 Fundamentals of Communication** (FA, SP, SU) Interpersonal and public communication with emphasis in developing both listening and speaking skills.

**COMM1313H Honors Fundamentals of Communication** (FA, SP, SU) Interpersonal and public communication with emphasis in developing both listening and speaking skills.

**COMM2303 Public Speaking** (FA, SP, SU) Continuing study of the invention and adaptation of oral discourse to the needs of listeners. Consideration of the problems of communication in platform presentation. Prerequisite: COMM 1313.

**COMM2323 Interpersonal Communication** (FA, SP, SU) Personal and interpersonal factors affecting communication in everyday life. Emphasis upon ways in which interpersonal perception, physical environment, semantic choices, and nonverbal cues affect communication primarily in the context of work, family, and other personal experiences.

**COMM2333 Introduction to Communication Research** (FA, SP) Introduction to the basic assumptions underlying communication inquiry; resources for and methods of data collection in communication research; and techniques for organization, interpretation, reporting, and evaluation of communication research.

**COMM2351 Parliamentary Procedure** (FA, SP) Study and practice of the rules and procedures by which self-governing organizations transact business. Prerequisite: sophomore standing.

**COMM2373 Introduction to Debate** (FA, SP) An introduction to the basic principles and procedures of debate as an instrument of critical choice and decision.

**COMM2382 Intercollegiate Forensics (IR)** Preparation and participation in public debates and other forensic activities. May be repeated for a maximum of 6 hours of credit. No more than 6 hours of credit in COMM 2382 and 3282 may be applied toward the departmental requirement. (A maximum of 12 hours in COMM 2382 and 3282 hours of credit.) May be repeated for 6 hours.

**COMM2813 Introduction to Electronic Media** (FA, SP) Introduction to the industries centered around electronic media, including radio, broadcast and cable television, telephony, computer information systems, and digital media. Emphasis on the historical development, organizational patterns, and cultural functions of the media.

**COMM3173 Introduction to Linguistics** (SP) Introduction to language study with stress upon modern linguistic theory and analysis. Data drawn from various languages reveal linguistic universals as well as phonological, syntactic, and semantic systems of individual languages. Related topics: language history, dialectology, language and its relation to culture and society, the history of linguistic scholarship. (Same as ANTH 3173, ENGL 3173) Prerequisite: junior standing.

**COMM3282 Advanced Forensics (IR)** A continuation of 2382. May be repeated for a maximum of 6 hours of credit. No more than 6 hours of credit in COMM 2382 and 3282 may be applied to the departmental requirement. (A maximum of 12 hours in COMM 2382 and 3282 may be counted toward the B.A. requirements.) May be repeated for 6 hours.

**COMM3303 Small-Group Communication** (FA, SP, SU) Procedures used in exchanging information, solving problems, determining policies, and resolving differences in committees and other small groups. Prerequisite: COMM 1313 and junior standing.

**COMM3333 Communication Criticism** (FA, SP, SU) Basic elements and theoretical perspectives on criticism of public communication. Extensive practice in written

analysis of events in public address, film, television, and other mass media.

### COMM3343 Contemporary Communication

**Theory (SP)** Study of the nature of the communication process as it is reflected in the individual, in interpersonal settings, in one-to-many situations, and in the mass media.

**COMM3353 Argumentation: Reason in Communication** (FA, SP, SU) Concepts characterizing rational discourse, with a concern for examining validity and fallacy. Consider traditional and contemporary models for analyzing argument, including an examination of the philosophy of argument and a practical inquiry into the uses of argument in contemporary rhetorical discourse.

**COMM3363 Nonverbal Communication** (SP) Creates an understanding of the functions of nonverbal cues operating in human communication processes and develops familiarity with recent research in the field of nonverbal communication.

**COMM3383 Persuasion** (FA) Introduction to theories of persuasion with emphasis on application and effect.

**COMM3433 Family Communication** (IR) Study of the nature, functions, and management of communication patterns in the family. Focus is on understanding routine interpersonal interactions, conflict patterns, authority structures, and decision-making processes within the context of the contemporary family.

**COMM3443 Introduction to Rhetorical Theory** (FA, SP) Interpretive-critical study of rhetoric in public contexts. Prerequisite: COMM 1313.

**COMM3673 Mediated Communication** (FA, SP) Focuses on media messages and their social/cultural effects. Includes a critical examination of media institutions and the ways they vie for audiences. Other topics include the ways people construct meaning from messages, media's influence on attitudes, media's role in cultural life, and audiences as critical consumers of media.

**COMM3703 Organizational Communication** (FA, SP) An introduction to the theory, processes, and management of communication in organizations, with opportunities for simulated application.

**COMM3803 Basic Video Production** (FA, SP) Introduction to techniques of studio video production, including the production process, live production, and basic editing techniques. Problems of program producers and directors related to production are also discussed.

**COMM3883 Rhetoric of Social Movements** (FA, SP, SU) Study of the functions of rhetoric as it appears in the context of social movements such as American independence, women's equality, civil rights, populism, and new conservatism.

**COMM3923H Honors Colloquium** (FA, SP, SU) Treats a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in communication).

**COMM3983 Special Topics** (FA, SP, SU) Communication topics that are not usually presented in depth in regular courses. May be repeated.

**COMM399VH Honors Course (1-6)** (FA, SP, SU) May be repeated for 12 hours. Prerequisite: junior standing.

**COMM4113 Legal Communication** (FA) 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.

**COMM4123 Communication, Gender, and Popular Culture** (IR) Studies representations of femininity and masculinity in popular culture contexts such as magazines, videos, television, advertising, film, popular music, and sports. Examines the various ways that media representations affect gender identities.

**COMM4143 American Film Survey** (FA, SP, SU) A survey of major American film genres, major directors and films that have influenced the development of motion pictures. (Same as ENGL 4143)

**COMM4283 Communication in Contemporary Society** (FA) An examination of research and theory on the process and effects of communication in modern society.

**COMM4313 Language and Society of Japan** (FA) The primary objective of this course is to investigate the way the Japanese language reflects the beliefs and customs 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. Prerequisite: junior standing.

### COMM4323 Communication and Conflict (SP)

Study of the processes, effects, and managements of communicative conflict, including a consideration of conflict styles, power, goals, tactics, assessment, self-intervention and third-party intervention. Prerequisite: COMM 1313 and junior standing.

**COMM4333 Communication and Gender** (SP) Study of the nature, construction, functions, and effects of gender and gender-role stereotypes related to verbal and nonverbal communication, small-group and organizational interaction, and mass mediated images in contemporary culture.

**COMM4343 Intercultural Communication** (FA) Study of intercultural communication skills, intercultural issues and their impact at home and abroad, and cross-cultural comparisons of communication phenomena from a variety of theoretical perspectives.

**COMM4353 American Public Address** (IR) Historical and critical study of the leading American speakers, their speeches, the issues with which they were identified. Lectures, discussion, reports, and critical papers. Prerequisite: junior standing.

**COMM4373 Political Communication** (SP) Study of the nature and function of the communication process as it operates in the political environment. (Same as PLSC 4373)

**COMM4383 Rhetoric of the Modern American Presidency** (FA, SP, SU) A study of the increasing reliance of contemporary presidents on public persuasion through rhetorical discourse.

**COMM4393 Freedom of Speech: Cases & Issues** (FA, SP) Study of philosophy, cases, and issues relevant to the first amendment right to the free expression, with focus on issues relevant to internal security, obscenity, pornography, slander, and the regulation of communication.

**COMM4413 Communication, Negotiation, Mediation and Conflict** (IR) Examines Alternative Dispute Resolution (ADR) research and techniques focusing primarily on negotiation and mediation. Supplements and extends material presented in COMM 4323 (Communication and Conflict). Explores the verbal and nonverbal messages occurring during negotiation and mediation situations in business, legal, and counseling environments. Prepares students for roles involving negotiation and mediation.

**COMM4623 Relational Communication** (SP) Review of the major theories and concepts in a relational approach to interpersonal communication. Provides exposure to a sampling of the research findings in relational communication.

**COMM4633 History and Development of International Film** (SP) 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 the present.

**COMM4683 Documentary Film** (FA) A study and analysis of the documentary film as a discrete film form and as an important contribution to the international cinematic scene. Prerequisite: advanced standing.

**COMM4793 Directing Forensics** (IR) Planning, directing, and coaching co-curricular forensics at the high school or college or both.

**COMM4833 Television Writing** (FA) Comprehensive analysis of the techniques and styles of television commercials, documentaries and dramatic TV plays. Class projects. Prerequisite: 5 hours radio-television-film and junior standing.

**COMM4843 Computer-Mediated Communication** (SP) Provides an in depth consideration of the nature of computer-mediated communication by examining its use and effects in interpersonal, work, educational, and societal contexts and in an introduction to the technologies and skills required for navigating the Internet. The course focuses on the social aspects of computer-mediated communication, rather than specific software or hardware technologies.

**COMM4853 Telecommunication Policy** (SP) Research and discussion of social, ethical, education, cultural, and technological aspects of telecommunications with attention given to changing programming patterns, world systems of broadcasting, data transmission, emerging technology, international politics, and regulatory policies. Prerequisite: junior or senior or graduate standing.

**COMM4863 Seminar in Television** (SP) Research/discussion of contemporary problems in television. emphasis on the economic and social impact of commercials, news, censorship, children's programs, blacks and women on television, future developments in telecommunications.

**COMM4883 Television and American Culture** (FA) Historical and critical study of how television shapes American



culture and is shaped by it. Attention will be given to the study of television history, programs, and audiences, particularly how race and gender shape content and reception of programming. Prerequisite: COMM 2333.

**COMM490V Special Problems (1-6) (FA, SP)** Credit arranged. May be repeated for 6 hours. Prerequisite: advanced standing.

**COMM4913 Internship in Communication (FA, SP, SU)** Internship in applied communication within public and private organizations. May be repeated for 6 hours. Prerequisite: junior standing and completion of 18 hours in communication courses.

**COMM5113 Historical and Legal Methods in Communication (FA)** Emphasizes the assumptions and procedures of historical and legal research methods in communication.

**COMM5111 Colloquium in Communication Research (FA, SP)** 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.

**COMM5123 Quantitative Research Methods in Communication (FA)** Emphasizes the assumptions and procedures of social scientific research methods in communication.

**COMM5133 Mass Communication Inquiry (SP)** Introduction to scholarly research in mass communication, including processes and effects, law and policy, critical/cultural studies, and economic analysis. Emphasis will be placed on theories within each area of inquiry.

**COMM5193 Seminar in Communication (FA, SP, SU)** 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.

**COMM5303 Seminar in Classical Rhetoric (SP)** Systematic investigation of the development of rhetorical theory in the Classical world with emphasis upon the contributions of Plato, Aristotle, Socrates, Cicero and Quintilian. Gives some consideration to the chief treatises of the medieval period. Lectures, oral and written reports, including a major research essay. Prerequisite: graduate standing.

**COMM5323 Seminar in Persuasion (FA)** Focus is on comparing theoretical accounts of persuasion and research evidence concerning the effects of various factors on persuasion.

**COMM5333 Communication Theory (SP)** Survey of the theoretical orientations in communication theory with primary focus on conceptual, theoretical, and philosophical issues.

**COMM5343 Interpersonal Communication (FA)** Theory and research concerning the exchange of information and the mutual influencing of behavior among people. Prerequisite: graduate standing.

**COMM5353 Rhetorical Criticism (SP)** 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. Practice in critical analysis of contemporary address.

**COMM5363 Seminar in Small Group Communication (SU)** A consideration of recent developments in small group research that relates to problem solving tasks, leadership and other kinds of human interaction through speech communication. Emphasis given to the interpersonal speech transaction and to the emergence of participant roles. (Same as SOCI 5363) Prerequisite: COMM 3303 or SOCI 4193.

**COMM5373 Content Analysis (IR)** Techniques for observing and analyzing the overt communication behavior of selected communicators. Prerequisite: graduate standing.

**COMM5383 Seminar in Political Communication (IR)** Research seminar focusing on selected topics such as candidate imagery, diffusion of political information, or political symbolism. (Same as PLSC 5383) Prerequisite: graduate standing.

**COMM5393 Seminar in Contemporary Rhetoric (SP)** Systematic study of contemporary perspectives on rhetoric including scholars such as Burke, Richards, Weaver, Grassi, MacIntyre, Derrida, and Rorty. Prerequisite: graduate standing.

**COMM5403 Organizational Communication**

**Theory (SP)** A seminar on the historical development of theory and research into communication processes occurring within an organizational setting. Lecture, discussion, oral and Prerequisite: graduate standing.

**COMM5413 Organizational Communication Research (SU)** A seminar on conducting applied research within an organizational setting. Prerequisite: COMM 5403 and graduate standing.

**COMM5423 Seminar in Mass Media Cognition (FA, SP, SU)** Seminar exploring how people learn from written, aural and visual mass media messages. Topics to include attention, memory, comprehension, emotional response, arousal, unconscious processing, picture perception and person perception. Seminar will be concerned with most popular media (e.g., television radio, newspaper, and film), and with several content genres (e.g., entertainment, news, advertising).

**COMM5433 Marital Communication (SP, Even years)** An exploration of the major theories and lines of research that examine marital communication in contemporary American life.

**COMM5443 Issues of Race and Gender in Interpersonal Communication (SP, Odd years)** An exploration of the major theories and lines of research that examine how race and gender influence interpersonal communication in everyday life in America.

**COMM5453 Myth and Communication Criticism (SP)** Seminar in major theories of mythology, including archetypal and ideological perspectives, and their applications to the criticism of public communicative events. Practice in written critical analysis. Prerequisite: graduate standing.

**COMM5503 Communication and Cultural Studies (FA)** 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.

**COMM5533 Family Communication (FA, Even years)** An exploration of the major theories and lines of research that examine family communication in contemporary American life.

**COMM569V Seminar in Film Studies (1-3) (IR)** 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, the film musical. (Same as ENGL 569)

**COMM590V Special Problems (1-6) (FA, SP, SU)** Credit by arrangement. Prerequisite: graduate standing.

**COMM5913 Internship in Communication (FA, SP, SU)** Internship in applied communication within public and private organizations. Prerequisite: 15 hours graduate level communication in residence.

**COMM600V Master's Thesis (1-6) (FA, SP)** Prerequisite: graduate standing.

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## (CSCE) COMPUTER SCIENCE AND COMPUTER ENGINEERING

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**CSCE1003 Survey of Computer Concepts (FA, SP, SU)** Vocabulary of computers, covering terminology and concepts of large and small computers. Uses of computers in science, business, and government. Introduction to use of a computer, but students wishing to learn programming language should take CSCE 1023/1021L. Credit will not be given for both this course and CSCE 1012.

**CSCE1012 College Computing Skills (FA, SP, SU)** Introduction to the computer; basic computing skills including operating systems, word processing, spreadsheet and data base management applications; Internet applications including electronic mail, remote computing via Telnet, file transfer via ftp, World Wide Web navigation and publication. No prior computing experience necessary.

**CSCE1023 Programming I (FA, SP)** Teaches how to design, implement, and document computer programs using techniques of good programming style. Pre- or Corequisite: CSCE 1021L.

**CSCE1023H Honors Programming I (FA)** This course is taken instead of CSCE 1023 by honor students. Introduction to computer languages, information structures, and the solution of numerical and non-numerical problems using a computer. Pre- or Corequisite: CSCE 1021M.

**CSCE1021L Programming I Laboratory (FA, SP, SU)** Laboratory exercises appropriate to Programming I. Pre- or Corequisite: CSCE 1023 or CSCE 1023H.

**CSCE1021M Honors Programming I Laboratory (FA)** Laboratory exercises appropriate to Programming I, Honors. Pre- or Corequisite: CSCE 1023H.

**CSCE1113 Introduction to Computers (FA, SP)** Introductory course for students majoring in computer science or computer engineering. Topics include Von Neumann architecture, data representation, high-level languages, looping, functions, and pointers. (Same as CENG 1113) Pre- or Corequisite: CSCE 1111L or CENG 1111L.

**CSCE1113H Introduction to Computers (FA, SP)** Introductory course for students majoring in computer science or computer engineering. Topics include Von Neumann architecture, data representation, high-level languages, looping, functions, and pointers. Corequisite: CSCE 1111M.

**CSCE1111L Introduction to Computers Laboratory (FA, SP)** Laboratory experiences to accompany CSCE 1113. (Same as CENG 1111L) Corequisite: CSCE 1113

**CSCE1111M Honors Introduction to Computers Laboratory (FA, SP)** Laboratory experiences to accompany CSCE 1113 H. Corequisite: CSCE 1113 H

**CSCE1123 Introduction to Programming (FA, SP)** Introductory course to programming. Topics include problem analysis and specification, design and test of programming solutions, tools, decomposition, abstraction, iteration and recursion, program I/O and files. Credit will be allowed for only one of CSCE 1023 and CSCE 1123. (Same as CENG 1123) Pre- or Corequisite: CSCE 1121L.

**CSCE1123H Honors Introduction to Programming (FA, SP)** Introductory course to programming. Topics include problem analysis and specification, design and test of programming solutions, tools, decomposition, abstraction, iteration and recursion, program I/O and files. Credit will be allowed for only one of CSCE 1023 and CSCE 1123H. Pre- or Corequisite: CSCE 1121M. Prerequisite: CSCE 1113.

**CSCE1121L Introduction to Programming Laboratory (FA, SP)** Laboratory experiences appropriate to CSCE 1123. (Same as CENG 1121L) Corequisite: CSCE 1123

**CSCE1121M Honors Introduction to Programming Laboratory (FA, SP)** Laboratory experiences appropriate to CSCE 1123H Corequisite: CSCE 1123H.

**CSCE2003 Assembler Language Programming (FA, SP, SU)** Study of the connection between hardware and machine language and between assembler and high-level languages. Topics include: binary and hexadecimal number systems and information representation; assembling, linking, loading and execution; DOS and BIOS; addressing schemes, macros, subroutines, conditional assembly, multitasking, and interrupts. Prerequisite: CSCE 2113.

**CSCE2133 Assembler Language Programming (FA, SP)** Study of the connection between hardware and machine language and between assembler and high-level languages. Topics include internal data representation, instructions, memory, and data, I/O, hardware control, and high-level language interfacing. (Same as CENG 2133) Prerequisite: (CSCE 1123 or CENG 1123) and CENG 2113.

**CSCE2143 Data Structures (FA, SP)** Applications of the element of data structures, arrays, linked lists, trees, stacks, and search techniques. (Same as CENG 2143) Prerequisite: (CSCE 1123 or CENG 1123) and (MATH 2554 or MATH 2043).

**CSCE2153 Introduction to Object Oriented Programming (SP)** An introduction to object oriented concepts and methodology, including classes and objects, inheritance, polymorphism, encapsulation, abstraction, code reuse, and software components. Introduction to an object oriented programming language and object oriented software development. Prerequisite: CSCE 1123 and CSCE 1121L.

**CSCE2812 Introduction to Internet/World Wide Web (FA)** Introduction to Internet and World Wide Web tools and resources, including Web browsers, robots and search engines, multimedia authoring systems, electronic publishing systems, virtual reality systems, network compatible CD-ROMs, network telecommunication and security systems, digital watermarking, Web sensors, internet authoring and programming languages. Corequisite: CSCE 2811L. Prerequisite: previous computer applications course or equivalent computer experience.

**CSCE2811L Introduction to Internet/World Wide Web Laboratory (FA)** Laboratory to accompany CSCE 2812. Students develop practical skills in, and learn to apply industry-wide standards and practices for, Web page design and layout, electronic publishing, network communications, cybermedia authoring systems, and such bandwidth-limiting enhancements as animation and applets. Corequisite: CSCE 2812.

**CSCE3213 Computer Organization (FA, SP)** An

introductory course in computer organization including topics in digital logic, digital systems, and memory structure. (Same as CENG 3213) Prerequisite: (CSCE 2133 or CENG 2133) and CENG 2113.

**CSCE3313 Algorithms (FA, SP)** 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. (Same as CENG 3313) Prerequisite: (CENG 2143 or CSCE 2143) and MATH 2103 and (MATH 2564 or MATH 3103).

**CSCE3412 Internet Programming (SP)** HTML authoring to W3C standards, use of environment and SSI variables, programming concepts with both scripting languages and interpreted and compiled languages, creating web documents, applications, advanced form applications, search/index utilities, Web databases. Course presumes some introduction to scripting or programming. Corequisite: CSCE 3411L. Prerequisite: CSCE 2812.

**CSCE3411L Internet Programming Laboratory (SP)** Lab will help student develop practical skills in, and learn to apply standards and practices for, Web site design and layout, network communications, cybermedia authoring systems, and animation, applets, etc. Course presumes some introduction to scripting or programming. Corequisite: CSCE 3412. Prerequisite: CSCE 2812.

**CSCE3753 Data Communication Systems (SP)** Introduction to data communication. Overview of the OSI model. Frequency Response, bandwidth filtering, and noise. Fourier series and transform, Information theory concepts such as Nyquist theorem, Shannon theorem, and Sampling theorem. Analog and digital modulation techniques. Pulse Code Modulation (PCM). Communication systems circuits and devices. Data encoding. Physical Layer Protocols. Data Link Control. Multiplexing and Switching. Pre- or Corequisite: STAT 3013. Prerequisite: CSCE 2113.

**CSCE390V Topics in Computer Science (1-6) (IR)** Topics not offered in depth in other computer science courses. May be repeated. Prerequisite: junior standing.

**CSCE3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the Honors Program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in computer science).

**CSCE4253 Concurrent Computing (IR)** Programming concurrent processes; computer interconnection network topologies; loosely coupled and tightly coupled parallel computer architectures; designing algorithms for concurrency; distributed computer architectures. Prerequisite: senior standing in computer science or engineering.

**CSCE4313 Introduction to Programming Languages (SP)** Comparison of the structure, features, compile and run-time characteristics of LISP, SNOBOL4, PASCAL, PL/1, FORTRAN, ALGOL, and APL. Syntax of programming languages, programming language structures, control structures, operators and operations, and language extensibility. The research paper in this class may fulfill the Fulbright College research paper requirement for computer science majors. Prerequisite: CSCE 2143

**CSCE4323 Introduction to Formal Languages and Computability (IR)** Finite Automata and regular languages, regular expressions, context-free languages and pushdown automata, nondeterminism, grammars, Turing machines, primitive recursive and m-recursive functions. Church's thesis, halting problem, and undecidability. Prerequisite: CSCE 4313.

**CSCE4413 Operating Systems (FA, SP)** An introduction to operating systems including topics in system structures, process management, storage management, files, distributed systems, and case studies. (Same as CENG 4413) Prerequisite: CSCE 3213 and CSCE 2143.

**CSCE4513 Software Engineering (FA, SP)** A modern approach to the current techniques used in software design and development. This course emphasizes the use of modern software development tools, multi-module programming, and team design and engineering. (Same as CENG 4513) Prerequisite: CSCE 3313

**CSCE4523 Database Management Systems (IR)** What a database management system is; different data models used to structure the logical view of the database; relational, hierarchical, and network. Implementation techniques for database systems: concurrency control, rollback and recovery, integrity and consistency, and view implementation. Prerequisite: CSCE 3313.

**CSCE4613 Artificial Intelligence (FA)** Representation of information and knowledge search strategies and heuristics for problem solution. Concepts of computer vision and natural language understanding. Current work in robotics, medicine, psychology. Introduction to AI languages (SAIL, LISP, DENTRAL). Prerequisite: CSCE 2143.

**CSCE4623 Intelligent Robot Control (IR)** Examines

software issues surrounding the creation and control of autonomous robots. Techniques include: genetic programming, artificial neural networks, reinforcement learning, and symbolic methods. Programs are run in simulation and on actual robotic controllers. Topics discussed include visual processing, spatial mapping, and learning. Prerequisite: CSCE 4613.

**CSCE4753 Computer Networks (IR)** The Internationals Standards Organization layered model; network topology; public and proprietary networks. Prerequisite: CSCE 3213 and CSCE 2143.

**CSCE490V Special Problems (1-6) (IR)** Current research topics, state of the art, or advanced methodology in one of the major computer science areas, programming languages, hardware and operating systems, theoretical aspects of computer science, artificial intelligence, and database design. May be repeated.

**CSCE4912H Honors Seminar (IR)** Topics for students in the honors program. May be repeated for 4 hours. Prerequisite: acceptance into the honors program and senior standing.

**CSCE498V Senior Thesis (1-6) (IR)**

**CSCE4991 Computer Science Review (FA, SP)** A course to review and appraise the knowledge of the fundamental concepts of computer science. A standardized, comprehensive examination is administered at the end of the course. Prerequisite: senior standing with 18 semester credit hours of graduation.

**CSCE5003 Advanced Programming Languages (SP)** Abstraction, proof of correctness, functional languages, concurrent programming, exception handling, dataflow and object oriented programming, denotational semantics. Prerequisite: graduate standing.

**CSCE5023 Architecture of Computer Systems**

(FA) An advanced study of both classical and recent computer hardware and software systems. Prerequisite: CSCE 3213 and CSCE 4413.

**CSCE5033 Design and Analysis of Algorithms (SP)** Design of computer algorithms, with primary emphasis on the development of efficient implementation. Prerequisite: graduate standing.

**CSCE5043 Artificial Intelligence (FA)** Provides students with an introduction to the major subjects and techniques of artificial intelligence. Topics include: machine learning, computer vision, natural language understanding, and AI languages. Prerequisite: CSCE 4613 and graduate standing.

**CSCE5083 Digital Circuit Design Verification (IR)** A study of the principles of formal verification as an alternative to simulation and testing in the elimination of logical design errors in digital systems. Prerequisite: CENG 2123 and graduate standing in CSCE and ELEG.

**CSCE5123 Databased Management systems (IR)** This course is an introduction to database systems for graduate students with no background on databases. We cover data modeling, basic concepts of the relational model, relational languages (algebra, SQL), databased design and database implementation. Prerequisite: CSCE 3313 and graduate standing.

**CSCE5203 Advanced Database Systems (IR)** Data and storage hierarchies, database models, user language designs, database manipulations. Prerequisite: CSCE 2143 and graduate standing.

**CSCE5233 Principles of Compiler Construction (IR)** Lexical analysis, parsing, symbol table construction, intermediate code generation, run-time simulation. Prerequisite: graduate standing.

**CSCE5243 Formal Languages (IR)** An advanced continuation of CSCE 4323. Prerequisite: CSCE 4323 and graduate standing.

**CSCE5263 Computational Complexity (IR)** Turing machines, recursion theory and computability, complexity measures, NP-completeness, analysis on NP-complete problems, pseudo-polynomial and approximation. algorithms. Prerequisite: graduate standing.

**CSCE5283 Graph and Combinatoric Algorithms (IR)** A study of algorithms for graphs and combinatorics with special attention to computer implementation and runtime efficiency. Prerequisites: Math 2103 and a programming language.

**CSCE5303 Parallel Programming (IR)** An analysis of parallel computer systems with respect to software engineering. Practical programming experience on pipelined, array, and multi-processor computers. Credit can be earned in only one of these three courses. CSCE 5303 or CENG 5303 or ELEG 5913. Prerequisite: working knowledge of 'C' language and CENG 4413 or equivalent.

**CSCE5313 Advanced Operating Systems (IR)**

Concurrent processes and process communication; mutual exclusion and synchronization principles; kernel philosophy; resource allocation and deadlock; case studies of specific operating systems. Prerequisite: CSCE 4413 and graduate standing.

**CSCE5513 Intelligent Robot Control (IR)** This course is designed to examine software issues surrounding the creation and control of autonomous robots. Techniques include: genetic programming, artificial neural networks, reinforcement learning, and symbolic methods. Programs are run in simulation and on actual robotic controllers. Topic discussed include visual processing, spatial mapping, and learning. Prerequisite: graduate standing

**CSCE5613 Introduction to Telecommunications (FA)** Overview of public and private telecommunication systems, traffic engineering, communications systems basics, information technology, electromagnetics, data transmission (same as ELEG 5613). (Same as ELEG 5613) Prerequisite: graduate standing in CSCE, ELEG, or ELEG 3133 or CSCE 3753.

**CSCE5633 Network Performance Evaluation (SP)** A study of performance modeling tools for telecommunication networks, computer networks, and wireless networks. Prerequisite: STAT 3013 and graduate standing in CSCE.

**CSCE5643 Computer Communication Networks (SP)** A study of computer communication networks, including the data link layer, routing, flow-control, local area networks, TCP/IP, ATM, B-ISDN, queueing analysis, and recent developments in computer communications. Prerequisite: graduate standing in CSCE.

**CSCE5713 Multimedia Systems Design (IR)** Overview of digital unified multimedia. Programming methodology involved in integration of all forms of digitized information (e.g., text, sound, graphics, animation, and process control) in a single computer-based interactive environment.

**CSCE5723 Client-Server Computing (IR)** Advanced Object Oriented methods for designing software systems for network applications. Topics include implementations of distributed object models, remote database connectivity. Server side programming, and reusable components. Prerequisite: CSCE 5743.

**CSCE5733 Information Agency (FA, SP, SU)** The study of software agents and their deployment on the internet: precursors to agents - viruses and worms, origins of software agents, delegate vs. representative agents, agency of the Internet and Web, operational guidelines for agents, HTTP, transaction security, MUD agency, intelligent agency, applications of agents: indexers, resource managers, search utilities, commercial applications.

**CSCE5743 Object Oriented Programming for the Internet (IR)** Object oriented design and programming for Internet client/server applications. Basics of the Internet, including TCP/IP protocol stack. Introduction to Object Oriented Programming and Object Oriented Design with Unified Modeling Language. Sockets application programming interface. Graphical user interfaces. Prerequisite: graduate standing.

**CSCE590V Advanced Topics in Computer Science (1-3) (IR)** Topics not covered in depth in other courses. Prerequisite: graduate standing.

**CSCE5953 Real-time Systems (FA, SP, SU)** A study of real-time system design. The development of real-time systems will be examined from the standpoint of academia, government, and industry. Scheduling, operating systems, and architecture considerations are among other topics to be covered.

**CSCE610V Master's Thesis (1-6) (FA, SP, SU)**

**CSCE620V Research in Computer Science (1-18) (IR)** Prerequisite: graduate standing.

**CSCE690V Graduate Seminar (1-6) (IR)** Concentrated study in selected areas of computer science research. May be repeated for 12 hours. Prerequisite: advanced graduate standing

**CSCE700V Doctoral Dissertation (1-18) (FA, SP, SU)** May be repeated for 5 hours.



## (CSES) CROP, SOIL, AND ENVIRONMENTAL SCIENCES

**CSES1012 Orientation to Crop, Soil, and Environmental Science (FA)** An introduction to majors in Crop Management and Environmental, Soil and Water Sciences with emphasis on issues in these disciplines and on developing academic abilities and communication skills. Required of all departmental majors with less than 24 semester credit hours. Recitation 2 hours per week.

**CSES1203 Introduction to Plant Sciences (FA, SP)** An introduction to basics of agricultural crop plant structure, growth, and production.

**CSES2003 Introduction to Weed Science (FA)** Fundamental, practical concepts of weed control and weed biology; equipment and techniques used in modern weed control practices; and basic recommendations and systems for specific agronomic and horticultural crops. Lecture 2 hours, laboratory 2 hours per week. Corequisite: CSES 2000L. Prerequisite: AGRI 1203 or CSES 2103 or HORT 2003.

**CSES2000L Introduction to Weed Science Laboratory (FA)** Corequisite: CSES 2003.

**CSES2013 Pest Management (FA, SP)** Introduction to basic principles of pest management as they relate to vertebrate animals, insects, plant disease and weeds. Selected pests are studies with emphasis on current management approaches and alternative pest control.

**CSES2103 Crop Science (SP)** Principles of crop growth, development, and utilization and how these principles relate to production. Emphasis on major agronomic crop species. Lecture 3 hours per week. Prerequisite: CSES 1203 or HORT 1203.

**CSES2101L Crop Science Laboratory (SP)** A series of laboratory experiments designed to reinforce principles of plant growth and development, reproduction, classification, and the utilization of plant products. Emphasis is placed on major crop plant species. Experiments are conducted by individuals or by teams. Laboratory consists of a single, 2-hour period each week. Required for Crop Management majors. Corequisite: CSES 2103.

**CSES2203 Soil Science (FA)** Origin, classification, and physical, chemical, and biological properties of soils. Lecture 3 hours, discussion 1 hour per week. (Same as ENSC 2203) Corequisite: CSES 2200D. Prerequisite: CHEM 1103.

**CSES2201L Soil Science Laboratory (FA)** Field and laboratory exercises related to the study of the physical, chemical, and biological properties of soils. Laboratory mandatory for all agronomy majors and optional for others. Laboratory 2 hours per week. Pre- or Corequisite: CSES 2203.

**CSES2200D Soil Science Discussion Drill (FA)** Corequisite: CSES 2203.

**CSES3023 Agronomy Colloquium (SP)** A communication-intensive course covering topics in agronomy and environmental, soil, and water science with particular emphasis on spoken communication but also including written communication, group activities, professionalism, ethics, problem solving, and information retrieval. A student-oriented class with collaborative participation. Colloquium workshop: 3 hours per week.

**CSES3113 Forage Management (SP)** Forage crops for pasture, hay, and silage with reference to growth and development, production, nutritional quality, and grazing systems. Lecture 3 hours per week. Prerequisite: CSES 1203.

**CSES3214 Intermediate Soil Science (FA)** Integration of the fundamental concepts of the biological, chemical, and physical properties of soil systems and their roles in managing soil resources. Lecture 3 hours, discussion 1 hour per week. Corequisite: CSES 3210D. Prerequisite: CSES 2203.

**CSES3210D Intermediate Soil Science Discussion Drill (FA)** Discussion will be used to enhance student comprehension of basic concepts. Discussion 2 hours per week. Corequisite: CSES 3214.

**CSES3312 Cotton Production (FA, Even years)** Principles and techniques associated with production of cotton. Recitation 2 hours per week. Prerequisite: CSES 1203.

**CSES3322 Soybean Production (SP, Odd years)** An overview of the history and utilization of soybean as well as the physiological and environmental basis for the development of economical soybean production practices. Recitation 2 hours per week. Prerequisite: CSES 1203.

**CSES3332 Rice Production (FA, Odd years)** A study of the principles and practices involved in rice culture

world wide with major emphasis on the United States. Recitation 2 hours per week. Prerequisite: CSES 1203.

**CSES3342 Cereal Grain Production (SP, Even years)** An overview of the botany, production, cultural practices, soil & climatic adaptation and utilization of the major cereal grain crops. Prerequisite: CSES 1203.

**CSES355V Soil Profile Description (1-2) (FA)** Training for soil profile description writing and membership of judging teams. May be repeated for 8 hours.

**CSES400V Special Problems (1-6) (FA, SP, SU)** Work on special problems in crop, soil and environmental sciences or related field. May be repeated for 8 hours.

**CSES4013 Advanced Crop Science (SP)** Fundamental concepts of crop physiology, crop improvement, seed science, and crop production systems. Recitation 3 hours per week. Prerequisite: CSES 2103.

**CSES402V Special Topics (1-3) (IR)** Studies of selected topics in crop, soil and environmental sciences not available in other courses. May be repeated.

**CSES4043 Environmental Impact and Fate of Pesticides (FA)** Environmental issues associated with pesticide use, including fate of pesticides in the environment, ecological impact of pesticides, and exposure risks to humans. Course recommended for students who have 12 hours of biological and/or physical sciences or consent. Lecture 3 hours per week.

**CSES4093 Issues in Pest Management (SP)** Lecture and discussion on local, regional, national and international issues related to pest management policy, ethics, environment, society and science (not for graduate credit). (Same as ENTO 4093, PLPA 4093) Prerequisite: must have completed 60 hours of coursework.

**CSES4103 Plant Breeding (FA, Even years)** Basic principles involved in plant breeding programs to improve crop plants and seed programs. Lecture 2 hours, laboratory 2 hours per week. Corequisite: CSES 4100L. Prerequisite: ANSC 3123.

**CSES4100L Plant Breeding Laboratory (FA, Even years)** Corequisite: CSES 4103.

**CSES4133 Weed Identification, Morphology, and Ecology (FA)** 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 that aid identification, habitat of growth and distribution, ecology, competition, and allelopathy are discussed. Lecture 2 hours, laboratory 2 hours a week. Corequisite: CSES 4130L. Prerequisite: CSES 2103 (or HORT 2003) and CSES 2003.

**CSES4130L Weed Identification, Morphology, and Ecology Laboratory (FA)** Corequisite: CSES 4133.

**CSES4143 Principles of Weed Control (SP)** 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. Corequisite: CSES 4140L. Prerequisite: CHEM 2613 and CHEM 2611L and CSES 2003.

**CSES4140L Principles of Weed Control Laboratory (SP)** Corequisite: CSES 4143.

**CSES4224 Soil Fertility (FA)** 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. Corequisite: CSES 4220L. Prerequisite: CSES 2201L and CSES 2203.

**CSES4220L Soil Fertility Laboratory (FA)** Corequisite: CSES 4224.

**CSES4234 Plant Anatomy (SP)** Advanced training in plant anatomy. Studying the structure, terminology, techniques and function associated with vascular plant anatomy. Corequisite: CSES 4230L. Prerequisite: BOTY 1613/1611 or BIOL 1543/1541.

**CSES4230L Plant Anatomy Lab (SP)** Corequisite: CSES 4234.

**CSES4253 Soil Classification and Genesis (SP)** 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. Corequisite: CSES 4250L. Prerequisite: CSES 2203.

**CSES4250L Soil Classification and Genesis Laboratory (SP)** Corequisite: CSES 4253.

**CSES4263 Environmental Soil Science (SP)** Study of the behavior of pesticides, toxic organic compounds, metals, nutrients, and pathogenic microorganisms in the soil/plant/water continuum. Lecture 3 hours per week. (Same as ENSC 4263) Prerequisite: CSES 3214.

**CSES462V Internship (1-6) (FA, SP, SU)** Supervised practical work experience in agronomy and environmental science to develop and demonstrate professional competence. Faculty approval of project proposal prior to enrollment and written and oral reports after the project is complete are required. May be repeated for 6 hours. Prerequisite: junior standing.

**CSES4803 Precision Agriculture (FA, Odd years)** Introduction to precision agriculture, benefits, spatial variability within a field, zone concept, site-specific management. Spatial data collection: sensors, GPS, yield monitoring, remote sensing. Knowledge discovery from data: data processing, neural networks, genetic algorithms, use of GIS. Decision support systems. Variable-rate technology: real-time and map-based systems, variable-rate machinery, smart controls. Evaluation: yield mapping, economic analysis. Prerequisite: MATH 1213 and basic computer skills, descriptive statistics.

**CSES4800L Precision Agriculture Laboratory (FA, Odd years)**

**CSES5001 Weed Science Practicum (SU)** Training for membership on weed team, through participation. Prerequisite: graduate standing.

**CSES5013 Crop Physiology (FA, Odd years)** Understanding and quantitative measurement of physiological processes, plant responses, and environmental parameters in relation to the production of crops. Prerequisite: BOTY 4304.

**CSES5023 Weed Physiology and Herbicide**

**Resistance in Plants (FA, Odd years)** 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: CSES 5020L. Prerequisite: CSES 4143 and (BOTY 4304 or CHEM 5813).

**CSES5020L Weed Physiology and Herbicide Resistance in Plants Lab (FA, Odd years)** Corequisite: CSES 5023.

**CSES502V Special Problems Research (1-6) (FA, SP, SU)** Original investigations on assigned problems in agronomy. Prerequisite: graduate standing.

**CSES5033 Plant Nutrition (FA, Even years)** Study of water uptake, ion absorption, translocation and metabolism in higher plants. Lecture 3 hours per week. Prerequisite: BOTY 4304 and CHEM 2613 and CHEM 2611L.

**CSES504V Special Topics (1-4) (IR)** Topics not covered in other courses or a more intensive study of specific topics in agronomy. May be repeated. Prerequisite: graduate standing.

**CSES5053 Scientific Writing (FA)** Open to graduate students, especially those in agricultural and life sciences. The course will cover searching the scientific literature, writing theses, proposals, journal articles, and other scientific documents. Emphasis on style and techniques used in scientific publication. Lecture and workshop 3 hours per week. Prerequisite: graduate standing.

**CSES5103 Scientific Presentations (FA, SP)** 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.

**CSES5124 Crop Molecular and Physiological Genetics (SP, Even years)** Study of genome organization and expression in agronomic and horticultural plants, with emphasis on genes regulating physiological processes. Lecture 3 hours, discussion 1 hour per week. (CSES 5013 and CHEM 5813 and CHEM 5843 are recommended but not required). (Same as HORT 5124) Corequisite: CSES 5120D. Prerequisite: BOTY 4304 and ANSC 3123 (or BIOL 3321L and BIOL 3323).

**CSES5120D Crop Molecular and Physiological Genetics Discussion Drill (SP, Even years)** Corequisite: CSES 5124.

**CSES5204 Applied Math Methods in Life Sciences (FA, Odd years)** Methods of data presentation and mathematical descriptions of research data in the life sciences including graphical presentations, linear regression, growth equations, kinetics, transport equations, and compartmentalization. Analytical, numerical, and statistical approaches to the solution of research problems in life sciences will be emphasized. Lecture 3 hours, laboratory 2 hours per week. (Same as AGST 5204) Corequisite: CSES 5200L. Prerequisite: MATH 2564 and AGST 4023.

**CSES5200L Applied Math Methods in the Life Sciences Laboratory (FA, Odd years)** Laboratory

computer experience designed to reinforce material taught in CSES 5204. Laboratory consists of a single 2-hour period each week. (Same as AGST 5200L) Corequisite: CSES 5204.

**CSES5214 Analytical Research Techniques in Agronomy** (FA, Even years) 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: CSES 5210L. Prerequisite: BOTY 4304 and CHEM 2613 and CHEM 2611L.

**CSES5210L Analytical Research Techniques in Agronomy Laboratory** (FA, Even years) Laboratory experiments designed to reinforce principles of research techniques taught in CSES 5214. Experiments are conducted by individuals or by teams. Laboratory consists of a single 4-hour period each week. Corequisite: CSES 5214.

**CSES5224 Soil Physics** (SP) 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: CSES 5220L. Prerequisite: CSES 2203 and MATH 1203.

**CSES5220L Soil Physics Laboratory** (SP)

**CSES5243 Advanced Soil Fertility** (SP, Even years) An advanced consideration of the chemical, physical, and biological phenomena that influence the nutrient-supplying power of the soil. Lecture 3 hours per week. Prerequisite: CSES 4224.

**CSES5264 Soil Microbiology** (FA, Odd years) A study of the microorganisms in soil and the biochemical processes for which they are responsible. Lecture 3 hours, laboratory 3 hours per week. (Same as MBIO 5264) Corequisite: CSES 5260L. Prerequisite: MBIO 2013 and MBIO 2011L.

**CSES5260L Soil Microbiology Laboratory** (FA, Odd years) Laboratory exercises related to the study of microorganisms in the soil and the biochemical processes for which they are responsible. Laboratory 3 hours per week. (Same as MBIO 5260L) Corequisite: CSES 5264.

**CSES5353 Advanced Hay and Silage Production** (FA) Advanced study of the principles of good hay and silage production. The course includes a detailed review of forage nutritive value followed by an in-depth discussion of the management of wilting forage crops, silage biochemistry, ensiling characteristics of various forages, silo management, spontaneous heating in hay and silage, dry matter loss, management of stored hay, and changes in forage quality that result from poor conservation of harvested forages. Prerequisites: CSES 3113, ANSC 3152 and ANSC 3151L.

**CSES5453 Soil Chemistry** (SP, Even years) 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.

**CSES5543 Plant Genomics** (FA, Odd years) 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.

**CSES600V Master's Thesis** (1-6) (FA, SP, SU) Prerequisite: graduate standing.

**CSES6113 Herbicide Behavior** (FA, Even years) Biochemistry, physiology and behavior of herbicides in plants, soils, and the environment. Lecture 2 hours, laboratory 2 hours per week. Corequisite: CSES 6110L. Prerequisite: CSES 4143 and BOTY 4304 and CHEM 3813.

**CSES6110L Herbicide Behavior Laboratory** (FA, Even years) Corequisite: CSES 6113.

**CSES622V Advanced Topics in Soil Science** (1-3) (FA, SP) Topics include doctoral-level concepts in soil physics, soil chemistry, and soil microbiology/biochemistry not considered in other soil science courses. May be repeated. Prerequisite: graduate standing.

**CSES6253 Forage-Ruminant Relations** (SP, Odd years) 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. (Same as ANSC 6253) Prerequisite: ANSC 3143 and CSES 3113.

**CSES700V Doctoral Dissertation** (1-18) (FA, SP, SU) Prerequisite: graduate standing.

## (CVEG) CIVIL ENGINEERING

**CVEG1012 Civil Engineering Fundamentals** (FA, SP, SU) Introduces the concepts of engineering design and establishes the foundation of a professional career. Format and procedures for engineering calculations. Introduction to computer applications. Lecture 2 hours, drill 1 hour per week. Corequisite: CVEG 1010D.

**CVEG1010D Civil Engineering Fundamentals Drill** (FA, SP, SU) Corequisite: CVEG 1012.

**CVEG1113 Civil Engineering Computer Applications** (FA, SP, SU) Basic hardware and software principles of microcomputers and number systems. Use of software of mathematical modeling and presenting engineering results and concepts. Construction of programs for solving civil engineering problems. Internet communications and authoring. Introduction to the application of relational database management systems in the engineering domain. Prerequisite: CVEG 1012.

**CVEG2053 Surveying Systems** (FA, SP, SU) Coordinate, measuring, and total integrated surveying systems; total stations, electronic data collection, and reduction; error analysis; applications to civil engineering and surveying practice. Corequisite: CVEG 2051L. Prerequisite: MATH 2554.

**CVEG2051L Surveying Systems Laboratory** (FA, SP, SU) Laboratory exercises demonstrating the principles and practices of surveying systems. Corequisite: CVEG 2053.

**CVEG2113 Structural Materials** (FA, SP, SU) Production, properties, behavior, and structural applications of concrete, steel, timber, masonry, and plastic. Statistical analysis methods for quality control are also covered. Lecture 2 hours, laboratory 3 hours per week. Pre- or Corequisite: MEEG 3013. Corequisite: CVEG 2110L. Prerequisite: CVEG 1113.

**CVEG2110L Structural Materials Laboratory** (FA, SP, SU) Corequisite: CVEG 2113.

**CVEG3022 Public Works Economics** (FA, SP, SU) Continues the concepts of engineering design and the engineering approach to the solution problems. The principles and applications of engineering economy are introduced. Creative thinking is emphasized. Recitation 2 hours per week. Prerequisite: Junior standing.

**CVEG3133 Soil Mechanics** (FA, SP, SU) Introduction to geotechnical engineering. Properties of soils related to foundations, retaining walls, earth structures, and highways. Lecture 2 hours, laboratory 3 hours per week. Pre- or Corequisite: CVEG 3213. Corequisite: CVEG 3130L. Prerequisite: MEEG 3013.

**CVEG3130L Soil Mechanics Laboratory** (FA, SP, SU) Corequisite: CVEG 3133.

**CVEG3213 Hydraulics** (FA, SP, SU) Study of incompressible fluids. Topics include fluid properties, fluid statics, continuity, energy and hydraulic gradients, fundamentals of flow in pipes and open channels. Hardy Cross analyses, measurement of flow of incompressible fluids, hydraulic similitude and dimensional analysis. Lecture 2 hours, laboratory 3 hours per week. Corequisite: CVEG 3210L. Prerequisite: MEEG 2003.

**CVEG3210L Hydraulics Laboratory** (FA, SP, SU) Corequisite: CVEG 3213.

**CVEG3223 Hydrology** (FA, SP, SU) Use of ground water and surface water. Flood routing procedures in storage reservoirs and channels. Hydrologic planning including storage reservoir design, frequency duration analysis, and related techniques. Pre- or Corequisite: CVEG 3133 Prerequisite: CVEG 2053 and CVEG 3213.

**CVEG3243 Environmental Engineering** (FA, SP, SU) Introduction to theories and fundamentals of physical, chemical, and biological processes with emphasis on water supply and wastewater collection, transportation, and treatment. Lecture 2 hours, laboratory 3 hours per week. Corequisite: CVEG 3240L. Prerequisite: CVEG 3213 and CHEM 1123.

**CVEG3240L Environmental Engineering Laboratory** (FA, SP, SU) Corequisite: CVEG 3243.

**CVEG3253 Septic Systems** (SP, Odd years) An overview of designing, installing, and monitoring standard and alternative septic systems as well as the rules and regulations that impact septic system design and installation. Recitation 3 hours per week. Prerequisite: CSES 2203 or CVEG 3213.

**CVEG3304 Structural Analysis** (FA, SP, SU) Truss

analysis, influence lines for beams and frames, and effects of moving loads. Deformation of beams, frames, and trusses. Analysis of indeterminates structures by moment area, slope deflection, and moment distribution methods; approximate methods of analysis. Lecture 3 hours, laboratory 3 hours per week. Corequisite: CVEG 3300L. Prerequisite: CVEG 1113 and MEEG 3013.

**CVEG3300L Structural Analysis Laboratory** (FA, SP, SU) Corequisite: CVEG 3304.

**CVEG3413 Transportation Engineering** (FA, SP, SU) Introduction to highway and transportation engineering, planning, finance, economics, traffic, and geometric design of transportation facilities; theory and application of driver, vehicle and roadway characteristics as they relate to roadway and intersection design; safety, capacity, traffic operations, and environmental effects for highway engineering. Prerequisite: CVEG 2053.

**CVEG4003 CAD & Visualization for Civil Structures** (FA, SP, SU) Design process of infrastructures using 3 Dimensional (3D) Computer Aided Design and Engineering visualization with a highway design emphasis. Students produce a digital video for a designed civil structure as a class project. Develop skills in photo matching for placement of designed structures in real environment. Prerequisite: senior standing.

**CVEG4053 Land Surveying** (FA, SP, SU) Historical background of property surveys. Detailed consideration of original surveys and the United States Public Land Surveys. Writing adequate land descriptions. Interpretation of old descriptions. Excess and deficiency. Riparian rights. Field practice in relocation of old corners. Prerequisites: senior standing and CVEG 2053.

**CVEG4083 Control Surveys** (FA, SP, SU) Sun and Polaris observations for astronomic azimuth, solar access studies; control traversing, leveling, triangulation; state plane coordinate systems. Lecture 2 hours, laboratory 3 hours per week. Corequisite: CVEG 4080L. Prerequisite: CVEG 2053 and CVEG 2051L.

**CVEG4080L Control Surveys Laboratory** (FA, SP, SU) Corequisite: CVEG 4083.

**CVEG4143 Foundation Engineering** (FA, SP, SU) Analysis and design of retaining walls, footings, sheet piles, and piles. Determination of foundation settlements in sand and clay. Prerequisite: CVEG 1113 and CVEG 3133.

**CVEG4153 Earth Structures** (FA, SP, SU) The use of soil as a construction material including compaction, cement, lime, and fly ash stabilization. Special topics include seepage, slope stability, swelling, and collapsible soils. Prerequisite: CVEG 3133.

**CVEG4243 Environmental Engineering Design** (FA, SP, SU) Application of physical, biological, and chemical operations and processes to the design of water supply and wastewater treatment systems. Prerequisite: CVEG 3223 and CVEG 3243.

**CVEG4253 Small Community Wastewater Systems** (FA, SP, SU) Design of innovative and alternative wastewater collection, transport, and treatment systems typically suited for rural and small community applications. Recitation 3 hours per week. Prerequisite: CVEG 3243.

**CVEG4263 Environmental Regulations and Permits** (FA) Topics include federal and state environmental regulations, the permitting process, permit requirements and related issues. Prerequisite: CVEG 4243 and senior standing.

**CVEG4303 Reinforced Concrete Design I** (FA, SP, SU) Design of reinforced concrete elements with emphasis on ultimate strength design supplemented by working stress design for deflection and crack analysis. Prerequisite: CVEG 2113 and CVEG 3304.

**CVEG4313 Structural Steel Design I** (FA, SP, SU) Design of structural steel elements by elastic design the Load and Resistance Factor Design method. Intensive treatment of tension members, beams, columns, and connections. Pre- or Corequisite: CVEG 2113. Prerequisite: CVEG 3304.

**CVEG4353 Timber Design** (FA, SP, SU) Selection of timber beams, columns, and beam-columns. Physical properties of wood, analysis and design of timber connections. Truss design, glulam members, timber bridge design, treatment for decay, and fire protection. Pre- or Corequisite: CVEG 2113. Prerequisite: CVEG 3304.

**CVEG4363 Prestressed Concrete Design** (FA, SP, SU) Analysis and design of prestressed concrete flexural sections by working stress and ultimate strength design methods. Flexural behavior, moment-curvature diagrams, draping, anchorage zone design, torsion and shear, deflections, and prestress losses. Design of composite sections and continuous beams. Prerequisite: CVEG 4303.



**CVEG4393 Reinforced Concrete Design II** (FA, SP, SU) Optimum design of continuous beams. Design of walls, footings, slender columns, torsion and shear in beams, deep beams, brackets and corbels. Introduction to and design of structural slabs by the direct design method. Prerequisite: CVEG 4303.

**CVEG4403 Public Transportation** (FA, SP, SU) An introduction to the systems and technologies that provide the public transportation alternatives to the multi-modal transportation systems in urban and rural areas. A comparison of alternatives, procedures for planning, management and operations, and policies of public transportation. Prerequisite: CVEG 3413 or graduate standing.

**CVEG4413 Pavement Evaluation and Rehabilitation** (FA, SP, SU) Introduction of concepts and procedures for pavement condition surveys; evaluation by nondestructive and destructive testing; maintenance strategies; rehabilitation of pavement systems for highway and airfields; pavement management systems. Prerequisite: CVEG 4433.

**CVEG4423 Geometric Design** (FA, SP, SU) The geometric design of streets and highways, based on theory and application of driver and vehicle characteristics. Prerequisite: CVEG 3413.

**CVEG4420L Geometric Design Lab** (FA, SP, SU) Corequisite: CVEG 4423.

**CVEG4433 Transportation Pavements and Materials** (FA, SP, SU) Study of the engineering properties and behavior of materials commonly used in transportation facilities as they relate to the design and performance of flexible and rigid pavement systems. Lecture 2 hours, laboratory 3 hours per week. Prerequisite: CVEG 3133 and CVEG 3413 and INEG 3133.

**CVEG4430L Transportation Pavements and Materials Laboratory** (FA, SP, SU) Corequisite: CVEG 4433.

**CVEG4513 Construction Management** (SP) Introduction to methods and procedures for management of civil engineering construction projects including organization, plans and specs, cost estimating and bidding, project planning and finance, quality control/assurance, construction safety, cost management, labor issues, change orders, and subcontractor issues. Prerequisite: senior standing.

**CVEG4803 Structural Loadings** (FA, SP, SU) Theoretical background to and practical code requirements for various structural loadings. These include dead loads, occupancy loads, roof loads and ponding, snow loads, granular loads, vehicular loads, wind loading, and seismic loads. Prerequisite: CVEG 3304 and CVEG 4303 (or CVEG 4313).

**CVEG488V Special Problems (1-6)** (FA, SP, SU) Prerequisite: senior standing.

**CVEG4994 Civil Engineering Design** (FA, SP, SU) Conduct of a comprehensive open-ended design problem. Integration of prerequisite courses through site selection; preliminary design; evaluation of initial and life-cycle costs, formulation of specifications, assessment of alternatives, and consideration of constraints. Lecture 2 hours, laboratory 4 hours per week. Prerequisite: CVEG 3243 and CVEG 3413 and CVEG 3133 and CVEG 4303 (or CVEG 4313).

**CVEG4990L Civil Engineering Design Laboratory** (FA, SP, SU)

**CVEG5123 Measurement of Soil Properties** (FA, SP, SU) 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: CVEG 5120L. Prerequisite: CVEG 4143.

**CVEG5120L Measurement of Soil Properties Laboratory** (FA, SP, SU)

**CVEG5143 Transportation Soils Engineering** (FA, SP, SU) 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 3133.

**CVEG5163 Advanced Soil Mechanics** (FA, SP, SU) Study of consolidation, shear strength, clays, bearing capacity, and other soil mechanics topics. Emphasis on understanding the basis of soil mechanics topics. Prerequisite: CVEG 4143.

**CVEG5173 Advanced Foundations** (FA, SP, SU) 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.

**CVEG5234 Water and Wastewater Analysis** (FA, SP, SU) Application of chemistry to environmental engineering. Quantitative determinations of constituents in water and wastewater. Principles of bacteriological laboratory techniques. Lecture 3 hours, laboratory 3 hours per week. Prerequisite: CVEG 3243.

**CVEG5230L Water and Wastewater Analysis Laboratory** (FA, SP, SU)

**CVEG5243 Groundwater Hydrology** (FA) 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.

**CVEG5253 Microbiology for Environmental Engineers** (FA, SP, SU) Fundamental and applied aspects of microbiology and biochemistry relating to water quality control, wastewater treatment, and stream pollution. Prerequisite: CVEG 3243.

**CVEG5263 Stream Pollution Analysis** (FA, SP, SU) The determination and application of deoxygenation and reaeration rates to stream pollution analysis. A study of biological degradation rates for municipal and industrial wastes. Prerequisite: CVEG 3243.

**CVEG5283 Solid Waste Management** (FA, SP, SU) Collection, processing and disposal of solid waste with emphasis on incineration, and sanitary landfilling systems. Supplementary transportation and transfer systems are included. Hazardous waste disposal design and regulatory considerations are discussed. Prerequisite: CVEG 3243.

**CVEG5293 Water Treatment & Distribution System Design** (FA, SP, SU) Design of industrial and municipal water treatment plants. Discussion of raw and treated water requirements for the several uses. Distribution system analysis and design including distribution storage and pumping. Prerequisite: CVEG 3243.

**CVEG5313 Matrix Analysis of Structures** (FA, SP, SU) Energy and digital computer techniques of structural analysis as applied to conventional forms, space trusses, and frames. Prerequisite: CVEG 3304.

**CVEG5323 Structural Dynamics** (FA, SP, SU) 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 3304.

**CVEG5343 Highway Bridges** (FA, SP, SU) 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.

**CVEG5383 Finite Element Methods in Civil Engineering** (FA, SP, SU) 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.

**CVEG5403 Advanced Reinforced Concrete II** (FA, SP, SU) Design of 2-way slabs, flat slabs, and other floor systems; circular fluid and dry storage tanks; and rectangular tanks, walls, footings, and detailing. Prerequisite: CVEG 4303.

**CVEG5413 Transportation and Land Development** (FA, SP, SU) 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.

**CVEG5423 Structural Design of Pavement Systems** (FA, SP, SU) 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.

**CVEG5433 Traffic Engineering** (FA, SP, SU) A study of both the underlying theory and the use of traffic control devices (signals, 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.

**CVEG5443 Transportation Planning Methods** (FA, SP, SU) Procedures and methodologies for developing multi-modal transportation plans in urbanized areas. The development and utilization of transportation studies used in transport behavior and modeling. Prerequisite: graduate standing.

**CVEG5453 Asphalt Mix Design and Construction** (FA, SP, SU) Theory and practice of asphalt concrete mix design for pavements and bases including specifications and construction methods for hot-mixes and surface treatments. Lecture 2 hours, laboratory 3 hours per week. Prerequisite: CVEG 3413 and CVEG 4433.

**CVEG5450L Asphalt Mix Design and Construction Laboratory** (FA, SP, SU)

**CVEG5463 Transportation Network Modeling** (FA, SP, SU) An analytical approach to the use of mathematical techniques and computer models to represent urban transportation systems. Deterministic and stochastic methods for trip generation, distribution, modal choice, and assignment. Prerequisite: CVEG 5443.

**CVEG5473 Transportation System Characteristics** (FA, SP, SU) Introduction to traffic flow theory, including traffic stream interactions and capacity. Applications for planning, design, operations. Prerequisite: CVEG 3413 and graduate standing.

**CVEG5483 Transportation Management Systems** (FA, SP, SU) Six transportation management systems are explored: pavement, bridge, intermodal, public transportation, safety, and congestion. System approaches are presented. Techniques are introduced on how to optimally allocate resources. Pavement and bridge structure basics are discussed and their performance parameters are presented. Case studies are used to illustrate the interfaces among various modes of transportation. Safety and congestion problems in transportation are addressed.

**CVEG5493 Infrastructure Management with GIS & DB** (FA, SP, SU) Use of the major components of a Geographical Information System (GIS). Learn to define project schema, create a project build categories and features, and perform database joins. Use of dynamic segmentation and multimedia capabilities. Application of Relational Database Management System (RDBMS) and database interface service to GIS. Introduction to Global Positioning System (GPS). Prerequisite: CVEG 3413.

**CVEG562V Research (1-6)** (FA, SP, SU) Fundamental and applied research. Prerequisite: graduate standing.

**CVEG563V Special Problems (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**CVEG5734 Advanced Wastewater Process Design and Analysis** (FA, SP, SU) 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. Prerequisite: CVEG 5234.

**CVEG5730L Advanced Wastewater Process Design and Analysis Laboratory** (FA, SP, SU)

**CVEG5753 Air Pollution** (FA, SP, SU) Fundamentals of air pollution causes, effects, and measurements, as well as control methods with application to current industrial problems. (Same as CHEG 5753) Prerequisite: graduate standing.

**CVEG600V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**CVEG700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

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## (DANC) DANCE

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**DANC1003 Basic Course in the Arts: Movement and Dance** (FA, SP, SU) Introduction to the nature and scope of ballet, modern dance, and ethnic-ritual-world dance forms, their potential for contributing towards multicultural literacy, and to the shaping of an American audience. Comprised of lectures, videos, and movement experiences in the form of Studio Labs.

**DANC1003H Honors Basic Course in the Arts: Movement and Dance** (FA, SP, SU) Introduction to the nature and scope of ballet, ethnic, and modern dance forms, their potential for contributing towards multicultural literacy, and to the shaping of an American audience. Comprised of lectures, videos, and movement experiences in the form of studio labs. Prerequisite: honors standing.

**DANC1553 Practicum in Choreography and Improvisation** (FA, SP, SU) Introduces the student to the structure of modern dance movement and composition. Student explores the basic elements of dance: space, time, shape, and rhythm through the use of improvisational movement problems and formal choreographic studies. Prerequisite: DANC 1912.

**DANC1912 Beginning Modern Dance** (FA, SP) Introduction to basic techniques with an emphasis on acquiring flexibility, strength, and coordination.

**DANC1922 Beginning Modern Dance II** (FA, SP, SU) A continuation of basic modern dance techniques from DANC 1912, with emphasis on weight, time, and shape in movement. Prerequisite: DANC 1912.

**DANC1932 Beginning Ballet** (FA, SP) Introduction to the basic techniques of ballet in the recognized classic form including barre exercises, port de bras, and center practice.

**DANC1942 Beginning Ballet II** (FA, SP, SU) A continuation of the basic techniques of classical ballet from DANC 1932. Prerequisite: DANC 1932.

**DANC1951 Tap Dance** (FA, SP) Basic steps and combinations of tap dancing.

**DANC2951 Theatre Dance** (FA) Contemporary dance forms of the musical comedy stage. Prerequisite: DANC 1951.

**DANC2981 Jazz I** (FA) Basic techniques and combinations of stylized movement. Prerequisite: DANC 1912 or DANC 1932.

**DANC2991 Jazz II** (SP) Intermediate techniques and combinations of stylized movement. Prerequisite: DANC 2981.

**DANC3912 Intermediate/Advanced Practicum in Modern Dance Technique** (FA, SP, SU) Further develops space-time coordination and more complex dance techniques that emphasizes the development of individual style. Prerequisite: DANC 1912.

**DANC3932 Intermediate/Advanced Practicum in Ballet Technique** (FA, SP, SU) Designed to refine alignment, improve control and precision, and develop performance presentation for executing adage and allegro combinations. Prerequisite: DANC 1932.

**DANC5003 Practicum in Using the Arts to Teach About Culture in Grades K - 6** (SU) Designed for the elementary classroom teacher, the course assist the student in creating meaningful pedagogical methods and materials to be used for introducing children to a variety of cultures.

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## (DEAC) DANCE EDUCATION/ACTIVITY

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**DEAC1951 Tap Dance** (FA, SP) Basic steps and combinations of tap dancing.

**DEAC1961 Ballroom Dance** (FA, SP) The fundamentals of ballroom dance.

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## (DRAM) DRAMA

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**DRAM1003 Basic Course in the Arts: Theatre Lecture** (FA, SP, SU) Introduction to theatre arts; playwrighting, directing, acting, and design. For the general student. May not be presented toward satisfaction of the B.A. in fine arts requirement by drama majors.

**DRAM1003H Honors Basic Course in the Arts: Theatre Lecture** (FA, SP, SU)

**DRAM1223 Introduction to Dramatic Art** (FA, SP) Introduction to and examination of the various elements make up dramatic art. Study of the history, literature, theory, practice of the theatre, from ancient to modern times, from the playwright to the producer.

**DRAM1313 Stage Technology I: Costumes and Makeup** (FA) Fundamentals of basic costume construction with an emphasis on techniques, planning and process. Theories and principles of makeup as related to dramatic production with practical laboratory experience. Corequisite: DRAM 1311L.

**DRAM1311L Stage Technology I Laboratory** (FA) Practicum in costume technology and makeup. Corequisite: DRAM 1313.

**DRAM1323 Stage Technology II: Scenery and Lighting** (SP) Fundamentals of scenery and lighting technology with emphasis on theatre tools, equipment, and

basic drafting. Training in basic principles and skills of stage carpentry, lighting technology and rigging. Corequisite: DRAM 1321L.

**DRAM1321L Stage Technology II Laboratory: Scenery and Lighting** (SP) Practical application of principles of scenery and lighting technology. Students will participate in projects involving the construction and preparation of scenery, stage properties, and lighting associated with departmental productions. Production running crew positions will also be assigned. Corequisite: DRAM 1323.

**DRAM1333 Introduction to Design and Technical Production** (FA, SP, SU) The fundamentals of scenic, lighting, and costume design and the technical processes involved in the execution of these designs.

**DRAM1683 Acting I** (FA, SP, SU) An analytical approach to the actor's art with emphasis on the techniques of characterization.

**DRAM2313 Introduction to Theatrical Design** (FA) Fundamentals of design for the theatre including costume, lighting, and scenery. Study of the designer's role in the production process, design requirements, and aesthetics. Emphasis on the basic principles of two-dimensional art and graphic forms through various media, and a study of color and color theory as they apply to the major areas of theatrical design. Prerequisite: DRAM 1323.

**DRAM2683 Acting II** (SP) (Formerly DRAM 4603) Advanced theories and techniques of acting. Prerequisite: DRAM 1223 and DRAM 1683.

**DRAM272V Theatrical Production (1-3)** (FA, SP, SU) Participation in one or more major productions during the semester in the areas of scenery, lighting, or costume construction. May be repeated for 5 hours.

**DRAM3001 Theatre Practicum** (FA, SP, SU) Credit for participation in mainstage or faculty-directed productions: performance and/or technical assignments, one (1) credit hour per production. Assignments shall be determined by the faculty. Credit will be awarded only after completion of assignments and only with faculty approval. May be repeated for 4 hours.

**DRAM3213 Costume Design I** (FA) Study of the art and practice of stage costume design. Emphasis on the expression of character through costume. Development of rendering and research skills. Prerequisite: DRAM 1333.

**DRAM3243 Costume Technology I** (FA, SP, SU) Methods of costume construction techniques; exploration and practice in pattern drafting millinery, mask making, fabric painting and dying. Practical experience gained through work in departmental productions. Prerequisite: DRAM 1333.

**DRAM3433 Stage Speech** (FA, SP, SU) An introduction to the basic skills of speech, voice production and communication for performance and broadcasting. Special focus on general american speech and the characteristics of speech regionalisms. The course will explore breath control, resonance, articulation, pitch, volume, voice quality and stress management. Prerequisite: DRAM 2653.

**DRAM3653 Directing I** (FA, SP, SU) Basic principles and techniques of play directing with an emphasis on the modern realistic mode of production. Corequisite: Drama majors with at least junior standing. Prerequisite: DRAM 1223 and DRAM 2653.

**DRAM3733 Stage Lighting I** (SP) Study of the art and practice of stage lighting; color theory; electricity and dimming systems; problems in design. Lecture-demonstration 3 hours, laboratory, by arrangement, coinciding with departmental productions, 3 hours per week. Prerequisite: DRAM 1333.

**DRAM3803 Development of the Drama** (FA, SP) An introductory survey of theoretical approaches to theatre and drama. This course investigates various paradigms for understanding drama across traditional period boundaries. Readings include a cross-section of literary and performance theories ranging from the classical to the post-modern. Prerequisite: DRAM 1223.

**DRAM3823 Script Interpretation** (IR) Techniques for making sense of playscripts and finding their theatrical demands, including beat/objective/motive/ action structuring, use of the fictional and functional models of the text, imagery analysis, linguistic individuation, and indirect modes of meaning. Each student focuses on one script for the full term. Prerequisite: DRAM 1223 and DRAM 3803.

**DRAM3903 Theatrical Makeup** (FA, SP, SU) The techniques and skills of theatrical makeup and design involved in the creation and execution of characters for the stage. May be repeated.

**DRAM3923H Honors Colloquium** (FA, SP, SU) Treats a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in drama).

**DRAM399VH Honors Course (1-6)** (FA, SP, SU) May be repeated for 12 hours. Prerequisite: junior standing.

**DRAM406V Playwriting (1-3)** (FA) A workshop course for students who wish to attempt original work in the dramatic form. (Same as ENGL 406) May be repeated for 9 hours. Prerequisite: junior standing.

**DRAM4153 Musical Theatre Performance** (FA, SP, SU) Principles and techniques of performing a singing role for the theatre. Examines the relationship between score and text. May be repeated for 6 hours.

**DRAM4223 Costume Design II** (IR) Practical survey of historical costumes and the application of costume history to costume design for the theatre. Exploration of silhouettes, construction details, fabrics and accessories. Costume design and rendering emphasized. Prerequisite: DRAM 3213.

**DRAM4233 History of the Theatre I** (FA) A survey of dramatic literature, theatre practices and cultural contexts for dramatic presentation from classical Greece through the Restoration. Prerequisite: DRAM 3803.

**DRAM4333 History of the Theatre II** (SP) A survey of dramatic literature, theatre practices and cultural contexts for dramatic presentation from the 18th century to the mid-20th century. Emphasis is given to Western theatre practices. Prerequisite: DRAM 3803.

**DRAM4453 History of the Theatre III** (SP) An examination of history and theory of modern theatrical styles.

**DRAM4463 African American Theatre History — 1950 to Present** (SP) 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. (Same as AAST 499)

**DRAM4653 Scene Design I** (SP, Odd years) Theory and practice in the art of scenic design, including historical and contemporary styles and procedures. Practical experience gained through work on departmental productions. Prerequisite: DRAM 1333.

**DRAM472V Advanced Theatrical Production (1-3)** (FA, SP, SU) Individual creative studies for upper division students in scenery, lighting, sound, costumes, makeup, or special effects. May be repeated for 5 hours.

**DRAM4733 Dramatic Criticism** (FA, SP, SU) 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: DRAM 3803.

**DRAM4773 Acting Shakespeare** (FA, Even years) Work on the special techniques required for performance of the plays of Shakespeare and his contemporaries. The cultural and theatrical context required for understanding the scripts. Special attention to the speaking of blank verse. Prerequisite: DRAM 4603.

**DRAM478V Theatre Workshop (1-6)** (SU) Production of plays for public performance by all members of the workshop. Mornings are spent in instruction and laboratory work preparing sets, lighting, costumes, and properties. Afternoons are spent in instruction in acting and directing, rehearsal of plays in production. Special problems for graduate credit. Prerequisite: junior standing.

**DRAM490V Independent Study (1-3)** (FA, SP, SU) Individually designed and conducted programs of reading and reporting under the guidance of a faculty member.

**DRAM491V Special Topics (1-3)** (FA, SP, SU) Classes not listed in the regular curriculum, offered on demand on the basis of student needs and changes within the profession. May be repeated.

**DRAM492V Internship (1-12)** (IR) Supervised practice in the various arts and crafts of the theatre (e.g., full design responsibility for a box office management; actor apprenticeship in a professional company). Available only to those who have exhausted the regular curricular possibilities in the area of specialization. May be repeated for 12 hours.

**DRAM4953 Theatre Study in Britain** (FA, SP, SU) 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.

**DRAM5113 Scene Design II** (SP) Major styles and trends in scene design in relation to periods of dramatic literature. Problems in period and contemporary scene design. Prerequisite: DRAM 4653.

**DRAM5123 Theatrical Design Rendering Techniques** (FA, SP, SU) 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.

**DRAM5133 Scene Design III (FA, SP, SU)** Work in line, color, and composition using historical conventions as the basis for contemporary theatrical scenic statements. Prerequisite: graduate standing.

**DRAM5143 History of Decor for the Stage (FA, SP, SU)** 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.

**DRAM5153 Scene Painting (SP, SU)** A studio class in painting techniques for the theatre. Problems in color, texture, style and execution with appropriate analysis and research documentation. Graduate level project required.

**DRAM5163 Theatre Graphics and Technology (IR)** Advanced study of theatre drafting, drawing and rendering techniques and model making. Graduate level project portfolio required.

**DRAM5213 Costume Design (FA, SP, SU)** 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.

**DRAM5223 Costume Design II (FA, SP, SU)** Practical survey of historical costumes and the application of costume history to costume design for the theatre. Exploration of silhouettes, construction details, fabrics and accessories. Costume design and rendering emphasized. Prerequisite: DRAM 5213.

**DRAM5233 Costume Design III (FA, SP, SU)** Advanced study of costume design including the areas of film, dance, and opera. Exploration of advanced rendering techniques and stylization. Development of portfolio and resume. Prerequisite: DRAM 5223.

**DRAM5243 Costume Technology I (FA, SP, SU)** A series of projects focusing on methods of costume construction, pattern drafting techniques, millinery, mask making and fabric modification. Other topics may be included as determined by student needs.

**DRAM5253 Costume Technology II (FA, SP, SU)** Advanced study in methods of costume construction and pattern making techniques with emphasis on tailoring, draping, corsetry and costumes crafts as determined by student needs.

**DRAM5263 Costume Shop Management (FA, SP, SU)** Comprehensive study of costume shop management including physical space, equipment, personnel, budget and time management techniques. Practical application through actual production experience in the University Theatre.

**DRAM5323 Stage Lighting II (IR)** Entry level class for graduate study in lighting. Emphasis on lighting design and analysis, lighting for dance and musical theatre, equipment as it relates to the designer. Graduate level project required.

**DRAM5333 Lighting III (FA, SP, SU)** Advanced study of design, technology and production development collaboration involved in lighting at the professional level. Theatre, screen and architectural venues will be examined. Dance, musical theatre, legitimate drama and related lighting situations will be explored through class projects and laboratory exercises. Prerequisite: graduate standing.

**DRAM5353 Stage Lighting Technology (FA, SP, SU)** 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.

**DRAM5363 Theatre Planning (IR)** A study of significant theatre buildings, modern and historical, and their relationship to contemporary theatre planning. Practical application of theory through design problems and evaluation. Graduate level research project/paper required.

**DRAM5373 Theatre Management (IR)** Comprehensive study of arts management including personnel, budget, audience development, operations and organization for professional, academic and community theatre and related performance areas. Practical application through actual production experience in the University Theatre. Graduate level research paper required.

**DRAM5403 Acting/Directing Theories (FA, SP, SU)** Examination of the major forms of acting and directing techniques and theories. Practical application through analysis and scene work, with students functioning as both director and actor throughout the course. Prerequisite: graduate standing.

**DRAM5413 Graduate Acting Principles (FA, SP, SU)** An intensive study and practical application of acting techniques. Emphasizes the integration of the physical, emotional, and intellectual life of the character through work on monologues, scenes and exercises. Prerequisite: graduate standing.

**DRAM5432 Graduate Stage Speech (FA, SP, SU)** Training in skills of stage speech including voice production, resonance, articulation, facial structure, physical and vocal energy states and characterization. Standard American and selected European dialects. May be repeated for 4 hours. Prerequisite: graduate standing.

**DRAM5443 Graduate Acting: Period Styles (SP)** Acting in relation to periods of dramatic literature and cultural influences. Prerequisite: DRAM 4603 and graduate standing.

**DRAM5453 Musical Theatre Performance (FA, SP, SU)** 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.

**DRAM5463 Audition Techniques (FA, SP, SU)** 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.

**DRAM5473 Graduate Acting: Shakespeare (FA, SP, SU)** Analysis of Shakespeare for performance; work on the special techniques required for performance of the plays of Shakespeare and his contemporaries; including cultural and theatrical contexts required for understanding the scripts. Prerequisite: graduate standing.

**DRAM5503 Research Techniques in Drama (FA)** basic techniques of research and study in the fields of Drama and Theatre with consideration of the necessary interplay of intellectual and intuitive skills in mature artistry. Practice in the logical, semantic, and evidential work of scholarship and in the various research methodologies.

**DRAM5513 Graduate Playwriting: Realism (FA, SP, SU)** Advanced theory and technique in playwriting emphasizing the realistic mode. Explorations into the manner of expression, plotting the action, and revealing multiple levels of meaning. May be repeated for 6 hours.

**DRAM5523 Graduate Playwriting: Non-Realism (FA, SP, SU)** Advanced theory and technique in playwriting emphasizing non-traditional playwriting styles such as Expressionism, Surrealism, Epic Theatre and the American Musical. Prerequisite: graduate standing.

**DRAM5533 Graduate Playwriting: Special Projects (FA, SP, SU)** Advanced study and practice in the area of playwriting, the area of concentration will be determined by the student's specific writing project(s). May be repeated for 6 hours. Prerequisite: graduate standing.

**DRAM558V New Script Ensemble (1-3) (FA, SP, SU)** An interdisciplinary course for designers, actors, directors, and playwrights. An exploration of techniques and strategies for approaching the new script and realizing the distinctive elements pertinent to developing the new work. Prerequisite: graduate standing.

**DRAM5613 Graduate Directing: Realism (FA, SP, SU)** Theory and technique of directing realistic drama: script analysis; spatial considerations of composition and picturization; development in production of the Aristotelian concepts of plot, character, thought, diction, music (sound), and spectacle. Prerequisite: graduate standing.

**DRAM562V SEM: African-Amer Drama (1-9) (FA, SP, SU)** Research, discussion and projects focusing on a variety of topics including theatre management, advanced acting methods, and specialized periods in dramatic literature. Prerequisite: senior or graduate standing.

**DRAM5633 Graduate Directing: Non-Realism (FA, SP, SU)** Theory and techniques of directing in non-realistic modes. Scene study in the areas of Classical Drama, Expressionism, Epic Theatre, Epic Realism and contemporary staging methods. Prerequisite: graduate standing.

**DRAM5653 Directing II (FA, SP)** Advanced techniques of stage direction. Prerequisite: DRAM 3653 and graduate standing.

**DRAM5723 History of the Theatre I (FA)** A comprehensive study of the theatre in different cultures and ages, as an institution, as an art, and as a vision of life.

**DRAM5733 History of the Theatre II (SP)** A continuation of DRAM 5723.

**DRAM5753 History of the Theatre III (SP)** An examination of history and theory of modern theatrical styles.

Prerequisite: senior or graduate standing.

**DRAM5763 Dramatic Criticism (FA)** 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.

**DRAM581V Theatre Production III (1-3) (FA, SP, SU)** Participation in the process of production for the University Theatre mainstage at a supervisory level. Areas of involvement may include scenery, lighting, sound, makeup, marketing, etc. May be repeated for 6 hours.

**DRAM590V Independent Study (1-3) (FA, SP, SU)** Individually designed and conducted programs of reading and reporting under guidance of a faculty member.

**DRAM591V Special Topics (1-3) (FA, SP, SU)** Classes not listed in the regular curriculum, offered on demand on the basis of student needs and changes within the profession. May be repeated.

**DRAM592V Internship (1-12) (IR)** 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).

**DRAM600V Master's Thesis (1-6) (FA, SP)** Prerequisite: graduate standing.

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## (EASL) ENGLISH FOREIGN

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**EASL0024 Reading and Writing I (FA, SP, SU)**

Work on improving skills necessary to write a well-organized, thought-provoking essay incorporating paraphrased, summarized, and quoted ideas from various sources. Introduction to several rhetorical patterns. Critical reading skills practice, understanding inferences, and improving reading skills comprehension. Not for degree credit. Prerequisite: ESL placement test.

**EASL0021 Advanced English Grammar (FA, SP, SU)** Presentation of a general overview of the verb, modal, and article in English. Review and practice on compound and complex sentences. Practice of grammatical structure orally and in writing. Not for degree credit. Prerequisite: ESL placement test.

**EASL0034 Reading and Writing II (FA, SP, SU)**

Advanced writing of formal documented, organized, and thought-provoking essays. Students will learn to read passages/articles in English proficiently and maintain discussion with near-native abilities and confidence. Not for degree credit. Prerequisite: ESL placement test.

**EASL0041 Pronunciation (FA, SP, SU)** Students learn to generate native-sounding speech and increase their intelligibility by working specifically on accent reduction, pronunciation, intonation patterns, and fluency. Credit earned in this course may not be applied to the total required for a degree. Prerequisite: ESL placement test.

**EASL0053 ESL Listening and Speaking (FA, SP, SU)** For improvement of aura/oral skills by international students. Includes the basic practice in fluency, clarity, intonation, stress, and pronunciation. Students give presentations and participate in academic discussions. Credit earned in this course may not be applied to the total required for a degree. Prerequisite: ESL placement test.

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## (ECON) ECONOMICS

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**ECON1123 Economic Development of the United States (FA, SP, SU)** Development of American economic institutions from Colonial times to present. Present-day economic institutions and problems. (Credit not granted to students who have already completed ECON 2013 and ECON 2023.)

**ECON2013 Principles of Macroeconomics (FA, SP, SU)** Macroeconomic analysis, including aggregate employment, income, fiscal and monetary policy, growth and business cycles. Prerequisite: (MATH 1203 or higher) or (MATH ACT of 25 or higher) or (MATH SAT of 580 or higher) or (MATH 2043 or higher).

**ECON2013H Honors Principles of Macroeconomics (FA, SP, SU)** Macroeconomic analysis, including aggregate employment, income, fiscal and monetary policy, growth and business cycles. Prerequisite: (MATH 1203 or higher) or (MATH ACT of 25 or higher) or (MATH SAT of 580 or higher) or (MATH 2043 or higher).

**ECON2023 Principle of Microeconomics (FA, SP, SU)** Microeconomic analysis, including market structures, supply and demand, production costs, price and output, international economics. Prerequisite: (MATH 1203 or higher)

or (MATH ACT of 25 or higher) or (MATH SAT of 580 or higher) or (MATH 2043 or higher).

**ECON2023H Honors Principle of Microeconomics** (FA, SP, SU) Microeconomic analysis, including market structures, supply and demand, production costs, price and output, international economics. Prerequisite: (MATH 1203 or higher) or (MATH ACT of 25 or higher) or (MATH SAT of 580 or higher) or (MATH 2043 or higher).

**ECON2143 Basic Economics-Theory and Practice** (FA, SP, SU) Surveys basic micro, macro principles and analytical tools needed to study contemporary economic problems such as inflation, unemployment, poverty, pollution. Not open to students majoring in Economics or Business Administration.

**ECON3033 Microeconomic Theory** (FA, SP, SU) Nature, scope, purpose of economic analysis; theories of demand, production, cost, firm behavior, allocation of resources, etc., in a market-oriented system. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON3053 Economics for Elementary Teachers** (FA, SP, SU) For students who plan to become teachers in elementary schools. Acquaints students with basic concepts, functioning of the American economic system. Not open to students majoring in Economics or Business Administration.

**ECON3133 Macroeconomic Theory** (FA, SP, SU) Theoretical determinations of national aggregate employment, income, consumption, investment, price level, etc. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON3333 Public Finance** (FA, SP, SU) Governmental functions, revenues; tax shifting, incidence; public expenditures, their effects; fiscal policy. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON3533 Labor Economics** (FA, SP, SU) Economic analysis of labor markets. Topics include analysis of labor demand and supply; human capital investment; wage differentials; discrimination; economic effects of labor unions and collective bargaining; public sector labor markets; unemployment; and labor market effects on inflation. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON3733 Experimental Economics** (SP) Introduction to the use of experimental economics with applications to monopoly, bilateral bargaining, competitive markets under various exchange rules, speculation, and public goods. Exposes students to a broad range of research and the methodological connections between theory and data. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON3833 International Trade** (FA, SP) Problems of the international economy, their significance to U.S. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON3843 Economic Development** (FA) Principles and theories that apply to development of countries. Particularly useful in the Latin American Studies Program. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON399VH Honors Course (1-3)** (IR) Primarily for students participating in Honors program. May be repeated for 6 hours.

**ECON4003H Economics Honors Colloquium** (IR) Explores events, concepts and/or new developments in the field of Economics. Prerequisite: Senior standing.

**ECON4033 History of Economic Thought** (SP) Historical, critical analysis of economic theories relative to their instructional background. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143 or ECON 3053.

**ECON410V Special Topics in Economics (1-6)** (IR) Covers special topics in economics not available in other courses. May be repeated for 6 hours. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4233 Current Economic Problems** (FA, SP, SU) Analyzes current economic problems, appraises alternative solutions. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4333 Managerial Economics** (FA) Applied theory of firm; emphasizes marginalism, cost, price policy, executive decision, of resources. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4343 Government in Business** (FA, SP, SU) The tools of economic analysis applied to the structure, conduct and performance of American industry with particular emphasis on the development of regulatory policy. Various ideologies and policy alternatives are considered. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON450V Independent Study (1-6)** (IR) Permits students on individual basis to explore selected topics in economics.

**ECON4533 Comparative Economic Systems** (FA)

Studies foundations of the market system, socialist economics and other forms of economics; a comparative evaluation of the performance of contemporary systems of economics. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4633 International Trade Policy** (FA, SP, SU) Problems of the international economy from a microeconomic perspective. Topics include analysis of the pattern and content of trade; trade in factors of production; and the applications of trade theory to the study of trade barriers such as tariffs and quotas. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4643 International Monetary Policy** (FA, SP, SU) Problems of the international economy from a macroeconomic perspective. Topics include national income accounting and the balance of payments; exchange rates and the foreign exchange markets; exchange rate policy; macroeconomic policy coordination; developing countries and the problem of 3rd world debt; and the global capital market. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4653 Economics of Multinational Enterprise** (FA, SP, SU) The tools of economic analysis applied to the operations of multinational enterprise. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON468V International Economics and Business Seminar (1-6)** (FA, SP, SU) Offered primarily in conjunction with international study abroad programs with an emphasis on international economics and business. May be repeated for 6 hours. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4733 Quantitative Economic Analysis** (FA) Use of mathematics to formulate and derive economic relationships. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**ECON4743 Introduction to Econometrics** (SP) Introduction to the application of statistical methods to problems in economics. Prerequisite: ((ECON 2013 and ECON 2023) or ECON 2143) and (MATH 2043 or MATH 2554) and (MATH 2053 or MATH 2053 C or ECON 4733) and ISYS 2013.

**ECON512V Workshop in Economic Education (1-3)** (IR) Overview of basic economic facts and principles with emphasis on means of employing them in the curriculum of elementary and secondary schools. Not open to majors in business and economics. Offered for degree credit in Education only. May be repeated for 3 hours.

**ECON5163 Introduction to Economic Theory and Analysis** (FA, SP, SU) Introduction to economic theory primarily for first year M.B.A. students. Surveys the analytic tools of both micro- and macroeconomics that are necessary for business decision making and study of contemporary economic and social problems such as inflation, unemployment, poverty, and international trade deficits. Prerequisite: graduate standing.

**ECON5333 Managerial Economics** (FA, SP, SU) Application of economic theory to business decisions. Prerequisite: ECON 5163 and ISYS 5103 and FINN 5203 and MATH 2043 and MATH 2053 or MATH 2053C.

**ECON5433 Macroeconomic Theory I** (FA, SU) 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.

**ECON5533 Microeconomic Theory I** (FA, SU) 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.

**ECON5563 History of Economic Thought** (FA) Seminar in development of economic ideas, theories; causes and development of schools of thought emphasized.

**ECON5613 Econometrics** (FA) Use of economic theory and statistical methods to estimate economic models. The single equation model are examined emphasizing multicollinearity, autocorrelation, heteroskedasticity, binary variables and distributed lags. An introduction to the simultaneous systems model is presented. Two 80 min. lecture periods weekly. (Same as AGECE 5613) Prerequisite: MATH 2043 and knowledge of matrix methods, which may be acquired as a corequisite and (AGECE 1103 or ECON 2023) and an introductory statistics course.

**ECON5623 Econometrics II** (SP) Use of economic theory and statistical methods to develop and estimate simultaneous equation models of an economy. Emphasis given to the problem of identification and the methods of estimating systems models. Frontier topics are introduced. (Same as AGECE 5623) Prerequisite: ECON 5433 and ECON 5533 and (ECON 5613 or AGECE 5613).

**ECON5853 International Economics Policy** (SP) An intensive analysis of the operation of the international economy with emphasis on issues of current policy interest. Prerequisite: ECON 5163.

**ECON600V Master's Thesis (1-6)** (FA, SP, SU)

**ECON6233 Microeconomic Theory II** (SP) 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.

**ECON6243 Macroeconomic Theory II** (FA) Further development of macroeconomic models to include uncertainty and asset pricing theory. Application of macroeconomic models to explain real world situations.

**ECON636V Special Problems in Economics (1-6)** (FA, SP, SU) Independent reading and investigation in economics.

**ECON643V Seminar in Economic Theory and Research I (1-3)** (FA)

**ECON644V Seminar in Economic Theory and Research II (1-3)** (SP) Independent research and group discussion.

**ECON700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

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## (EDAD) EDUCATIONAL ADMINISTRATION

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**EDAD5013 School Organization and Administration** (IR) Analysis of structure and organization of American public education; fundamental principles of school management and administration.

**EDAD5023 The School Principalship** (SP, SU) 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.

**EDAD5053 School Law** (IR) Legal aspects of public and private schooling; federal and state legislative statutes and judicial decisions, with emphasis upon Arkansas public education.

**EDAD5063 School Personnel Administration and Supervision** (IR) Principles, processes, and procedures of school personnel management, supervision, and staff development.

**EDAD5093 Effective Leadership in School Settings** (FA, SP, SU) Strategic planning, group facilitation and decision making, organizational behavior and development, professional ethics and standards, principles of effective educational leadership.

**EDAD5163 Current Educational Issues** (IR) Current problems, issues, and trends facing school administrators in Arkansas and the nation.

**EDAD574V Internship (1-6)** (FA, SP, SU) Supervised in-school/district experiences individually designed to afford opportunities to apply previously-acquired knowledge and skills in administrative workplace settings. May be repeated for 3 hours.

**EDAD599V Seminar (1-6)** (IR)

**EDAD600V Master's Thesis (1-6)** (FA, SP, SU)

**EDAD6023 School Facilities Planning and Management** (IR) School facilities planning, management, cost analysis, operations, and maintenance of the school plant.

**EDAD6053 School-Community Relations** (IR) 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.

**EDAD605V Independent Study (1-3)** (FA, SP, SU)

**EDAD6093 School District Governance: The Superintendency** (IR) Analysis of the organizational and governance structures of American public education at national, state, and local levels.

**EDAD6103 School Finance** (IR) Principles, issues and problems of school funding formulae and fiscal allocations to school districts.

**EDAD6173 School Business Management** (IR) Fiscal and resource management in public schools: budgeting, insurance, purchasing, and accounting.

**EDAD6333 Planning for Educational Change** (IR) Overview and analysis of the change process in education.



**EDAD6503 Administrative Theory & Leadership (IR)** Review of seminal and current theories of effective leadership, administration, and management in school settings; designed to develop diagnostic skills necessary for successful administration of complex educational enterprises.

**EDAD6523 Advanced Application of Educational Leadership (IR)** A review of seminal and current works on leadership as applied to the educational setting. Provides knowledge of classic and contemporary strategies for leadership.

**EDAD6533 Educational Policy (IR)** 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.

**EDAD6563 Educational Administration and Human Behavior (IR)** Examination of research and theory related to the utilization of human resources with educational organizations.

**EDAD660V Workshop (1-6) (FA, SP, SU)**

**EDAD674V Internship (1-6) (FA, SP, SU)** May be repeated for 6 hours.

**EDAD680V Educational Specialist Project (1-6) (FA, SP, SU)** An original project, research project, or report required of all Ed.S. Degree candidates. Prerequisite: admission to the Ed.S. program.

**EDAD690V Directed Readings in Educational Administration (1-3) (FA, SP, SU)** Selected readings from classical books and authors in the field.

**EDAD699V Seminar (1-6) (IR)** Prerequisite: advanced graduate standing.

**EDAD700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (EDFD) EDUCATIONAL FOUNDATIONS

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**EDFD5013 Research Methods in Education (FA, SP, SU)** General orientation course that considers the nature of research problems in education and the techniques used by investigators in solving those problems. Prerequisite: graduate standing.

**EDFD5303 Historical Foundations of Modern Education (FA, SP, SU)** Critical analysis and interpretation of the historical antecedents of contemporary education, focusing upon the American experience from the colonial period to the present.

**EDFD5323 Global Education (IR)** Comparative and global analysis of international education with emphasis on cultural education and implications for the future.

**EDFD5353 Philosophy of Education (IR)** Introduction to the method and attitude essential to effective analysis and interpretation of issues and values within a society reflecting cultural, ethnic, gender, and global diversity. Prerequisite: graduate standing.

**EDFD5373 Psychological Foundations of Teaching and Learning (IR)** 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.

**EDFD5393 Statistics in Education and Health Professions (FA, SP, SU)** 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.

**EDFD5473 Adolescent Psychology in Education (IR)** Study of the adolescent experience with emphasis on the unique psychological problems and tasks of this developmental stage; role of educators in the facilitation of crises resolutions in social, personal and institutional conflicts. Prerequisite: graduate standing.

**EDFD5573 Life-Span Human Development (FA, SP, SU)** Basic principles of development throughout the human life-cycle. Physical, cognitive, social, emotional, and personality development.

**EDFD5653 Educational Assessment (FA, SP)** 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.

**EDFD5683 Issues in Educational Policy (FA, SP, SU)** 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.

**EDFD599V Seminar (1-6) (IR)**

**EDFD600V Master's Thesis (1-6) (FA, SP, SU)**

**EDFD605V Independent Study (1-6) (FA, SP, SU)**

**EDFD6223 Educational Futurism (IR)** An integrative, holistic analysis and assessment of potential alternative futures to guide current educational practice. Prerequisite: graduate standing and history or philosophy of education.

**EDFD6403 Educational Statistics and Data Processing (FA, SP, SU)** 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: EDFD 5013 or equivalent.

**EDFD6413 Experimental Design in Education (FA, SP)** Principles of experimental design as applied to educational situations. Special emphasis on analysis of variance techniques used in educational research. Prerequisite: EDFD 6403 or equivalent.

**EDFD6423 Multiple Regression Techniques for Education (FA)** Introduction to multiple regression procedures for analyzing data as applied in educational settings, including multicollinearity, dummy variables, analysis of covariance, curvi-linear regression, path analysis. Prerequisite: EDFD 6403.

**EDFD6453 Applied Multivariate Statistics (SP)** 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: EDFD 6413.

**EDFD6533 Qualitative Research (FA, SP)** Introduction of non-quantitative methods, including data collection through interviews, field observation, records research, internal and external validity problems in qualitative research. Prerequisite: EDFD 6403.

**EDFD6543 Advanced Qualitative Research (SP)** Preparation for the conduct of qualitative research, structuring, literature reviews, data collection and analysis, and reporting results. May be repeated for 6 hours. Prerequisite: EDFD 6533.

**EDFD6613 Evaluation of Policies, Programs, and Projects (FA)** 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.

**EDFD6623 Techniques of Research in Education (FA, SP, SU)** Use of scientific method in attacking educational problems. Emphasis placed on the planning and design of research studies, collection of reliable and valid data, sampling methods, and analysis and interpretation of data. (Required Prerequisite: EDFD 6403.)

**EDFD6653 Measurement and Evaluation (IR)** 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: EDFD 6403.

**EDFD668V Practicum in Research (1-6) (FA, SP, SU)** Practical experience in educational research on campus, in school systems, or in other agencies in educational program development.

**EDFD699V Seminar (1-6) (IR)** Prerequisite: advanced graduate standing.

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## (EDUC) EDUCATION

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**EDUC100V Freshman Seminar (1-3) (IR)** The course is designed to support and assist freshmen in becoming successful, self-directed learners. Focus will be upon campus resources to help learners accomplish this goal and upon strategies for successful learning.

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## (ELED) ELEMENTARY EDUCATION

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**ELED600V Master's Thesis (1-6) (IR)**

**ELED605V Independent Study (1-18) (FA, SP, SU)**

**ELED680V Ed.S. Project (1-18) (FA, SP, SU)**

**ELED700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (ELEG) ELECTRICAL ENGINEERING

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**ELEG1001 Introduction to Electrical Engineering (FA)** The course will address the nature of the Engineering profession to engage in life-long learning. The course will outline the various technical areas encompassed within Electrical Engineering discipline. The course will also emphasize on Academic Affairs and issues.

**ELEG1011 Engineering Success and Ethics (SP)** Topics include: how to succeed ethically in the Engineering profession, development of efficient and productive habits in studying, attitude toward group work, respect of educators, active involvement in student societies, safety, legal and regulation issues, importance of humanities studies in the curriculum, and ethics of the profession and moral autonomy.

**ELEG2062L Measurements Laboratory (FA, SP, SU)** An introduction to laboratory procedures and electronic measuring instruments including multimeters, oscilloscopes, frequency counters, signal generators, power supplies, and wattmeters. Lecture 2 hour, laboratory 3 hours per week.

**ELEG2103 Electric Circuits I (FA, SP)** Introduction to circuit variables, elements, and simple resistive circuits. Analysis techniques applied to resistive circuits. The concept of inductance, capacitance and mutual inductance. The natural and step responses of RL, RC, and RLC circuits. Corequisite: ELEG 2101L. Prerequisite: completion of the pre-professional curriculum.

**ELEG2101L Electric Circuits I Laboratory (FA, SP, SU)** Experimental investigation of the steady-state behavior of resistive circuits excited by DC sources and transient behavior of simple R, L, and C circuits. Topics include fundamental laws of circuit theory applied to resistive networks and time response functions of R-L and R-C circuits. Corequisite: ELEG 2103.

**ELEG2113 Electric Circuits II (FA, SP)** Introduction to complex numbers. Sinusoidal steady-state analysis of electric circuits, active, reactive, apparent and complex power; balanced and unbalanced three-phase circuits; mutual inductance; the use of the Laplace transform for electric circuit analysis and two-port networks. Pre- or Corequisite: MATH 3404. Corequisite: ELEG 2111L. Prerequisite: ELEG 2103.

**ELEG2111L Electric Circuits II Laboratory (FA, SP, SU)** Experimental investigation of the steady-state behavior of circuits excited by sinusoidal sources. Topics include complex power, three-phase circuits, transformers, and resonance. Corequisite: ELEG 2113.

**ELEG2903 Digital Systems (FA, SP, SU)** An introduction to diodes and transistors gates, binary arithmetic, combinational logic, sequential logic, registers, counters, memory, computer organization. Corequisite: ELEG 2900L.

**ELEG2901L Digital Systems Laboratory (FA, SP, SU)** Experimental investigations into digital integrated circuits (IC's) use in combinational or sequential logic. Topics also include terminal properties of IC's and use of schematic capture and digital circuits simulator software. Corequisite: ELEG 2903.

**ELEG2900L Digital Systems Laboratory (FA, SP, SU)**

**ELEG2913 Digital Design II (FA, SP, SU)** Topics in digital hardware design include memory systems to include registers and both static and dynamic RAM, finite state machine (FSM) design approach, FSM optimization, FSM minimization/reduction and assignment, asynchronous circuits, and PLD implementations. Corequisite: ELEG 2910L. Prerequisite: ELEG 2903.

**ELEG2910L Digital Design II Laboratory (FA, SP, SU)**

**ELEG3062L Circuits and Electronics Laboratory (FA, SP, SU)** Experimental investigations into circuit analysis concepts along with other areas of electrical engineering. Various topics include 1st and 2nd order circuits



frequency response, fourier series, diodes, transistors, op amps, and filters. Lecture 1 hour, laboratory 3 hours per week. Prerequisite: ELEG 2062L and ELEG 3213.

**ELEG3123 System & Signal Analysis (SP)** Time Domain and Frequency Domain Analysis and Design of Analog Systems. Signal and System using Fourier Series, Fourier Transform and Laplace Transform Techniques, Analog Filter Design, State Space Analysis. Pre- or Corequisite: ELEG 3121L. Prerequisite: ELEG 2113.

**ELEG3121L Analog Signal Processing Laboratory (FA, SP)** Laboratory exercises associated with ELEG 3123 - Analog Signal Processing. Corequisite: ELEG 3123.

**ELEG3133 Digital Signal Processing (FA, SP, SU)** Time-Domain and Frequency-Domain Analysis and Design of Discrete-Time Systems, Sampling, A/D and D/A Conversion: Discrete Fourier Transform, Fast Fourier Transform and Z-transform signal and system analysis. Digital Filter Design. Pre- or Corequisite: ELEG 3131L. Prerequisite: ELEG 3123.

**ELEG3131L Signal Processing Laboratory (SP, SU)** Laboratory exercises associated with ELEG 3133 - Digital Signal Processing. Corequisite: ELEG 3133.

**ELEG3143 Stochastic Signal Processing (FA, SP, SU)** Review of system analysis. Probability. Random variables. Stochastic processes. Auto correlation and power spectral density. Systems with random inputs in the time and frequency domain. Applications. Pre- or Corequisite: ELEG 3133.

**ELEG3213 Electronics I (FA, SP, SU)** Introduction to electronic systems and signal processing, operational amplifiers, diodes, non-linear circuit applications, MOSFETS, and BJTs. Corequisite: ELEG 3211L. Prerequisite: ELEG 2903 and PHYS 2074 and MATH 2574.

**ELEG3211L Electronics I Laboratory (FA, SP, SU)** Experimental investigation into electronic circuit analysis concepts. Topics include: diode behavior and applications, zener diode regulator design, bipolar junction transistor biasing, BJT common-emitter amplifier design, and operational amplifier fundamentals. Corequisite: ELEG 3213.

**ELEG3223 Electronics II (FA, SP)** Differential Pair Amplifier, Current Mirrors, Active Loads, Multistage Amplifiers, Amplifier Frequency Response, Bode Plots, Millers Theorem. Short Circuit and Open Circuit Time Constant Methods, Feedback Amplifiers, Stability of Feedback Amplifiers. Corequisite: ELEG 3211L. Prerequisite: ELEG 3213 and MATH 3404.

**ELEG3221L Electronics II Laboratory (FA, SP, SU)** Selected experiments to illustrate and complement topics covered in companion course ELEG 3223 - Electronics II Laboratory. Corequisite: ELEG 3223. Prerequisite: ELEG 2113 and MATH 3404 and ELEG 3213.

**ELEG3303 Electromechanical Energy Conversion (FA, SP)** Steady state analysis of DC machines, transformers, induction machines and synchronous machines. Introduction to speed control of electric machines using power electronics. Corequisite: ELEG 3301L. Prerequisite: ELEG 2113 or (PHYS 2074 and ELEG 3903).

**ELEG3301L Electromechanical Energy Conversion Laboratory (FA, SP, SU)** This course is the associated laboratory component of ELEG 3303 - Electromechanical Energy Conversion. The following topics are covered: three-phase measurements, no-load, short-circuit and load tests of transformers, no-load, blocked-rotor and load tests of induction machines and synchronous machines, and speed control of induction machines. Corequisite: ELEG 3303.

**ELEG3703 Electromagnetics I (FA, SP)** Analysis of transmission lines with sinusoidal and transient excitation. Development and use of the Smith Chart and methods of impedance matching. Vector analysis, static form of Maxwell's equations, electrostatics, magnetostatics. Pre- or Corequisite: PHYS 2074 and MATH 2574.

**ELEG388V Special Problems (1-18) (FA, SP, SU)** One to 3 hours of credit. Individual study and research on a topic mutually agreeable to the student and a faculty member. Prerequisite: junior standing.

**ELEG3903 Electric Circuits and Machines (FA, SP, SU)** Basic electrical principles and circuits, some application to electromechanical systems. For engineering students other than those in electrical engineering. Prerequisite: MATH 2564 and PHYS 2074.

**ELEG3913 Engineering Electronics (FA, SP, SU)** Basic theory and applications of electronic devices and circuits. For engineering students other than those in electrical engineering. Prerequisite: ELEG 3903.

**ELEG3923 Microprocessor Systems Design (FA, SP, SU)** Introduction to 16-bit microprocessors and their application. Microprocessor architecture and program

language; interface devices; system design using microprocessors. Laboratory application. Corequisite: ELEG 3920D and ELEG 3921L. Prerequisite: ELEG 2903 or ELEG 3913.

**ELEG3921L Microprocessor Systems Design Laboratory (FA, SP, SU)** Experiments and demonstrations of microprocessor instruction, exception and interrupt handling, peripheral interfacing and timers. Corequisite: ELEG 3923.

**ELEG3920D Microprocessor Systems Design Drill (FA, SP, SU)** Corequisite: ELEG 3923.

**ELEG4062L Electrical Engineering Design Laboratory (FA, SP, SU)** Design and application in electrical engineering. Lecture 1 hour, laboratory 3 hours per week. Prerequisite: ELEG 3223 and ELEG 3923.

**ELEG4203 Semiconductor Devices (FA, SP, SU)** 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, analysis and design of field-effect transistors. Prerequisite: MATH 3404.

**ELEG4223 Design and Fabrication of Solar Cells (FA, SP, SU)** 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.

**ELEG4233 Introduction to Integrated Circuit Design (FA, SP, SU)** Design and layout of large scale digital integrated circuits using NMOS and CMOS technology. Topics include MOS devices and basic circuits, integrated circuit layout and fabrication, dynamic logic, circuit design, and layout strategies for large scale NMOS and CMOS circuits. Prerequisite: ELEG 3213.

**ELEG4243 Analog Integrated Circuits (FA, SP, SU)** Theory and design techniques for linear and analog integrated circuits. Current mirrors, voltage to base emitter matching, active loads, compensation, level shifting, amplifier design techniques, circuit simulation using computer-assisted design programs. Prerequisite: ELEG 3223 and ELEG 4203.

**ELEG4273 Electronics Manufacturing Processes (FA, SP, SU)** 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. Lecture 2 hours, laboratory 2 hours per week. (Same as INEG 4513) Corequisite: ELEG 4270L. Prerequisite: (ELEG 3903 or ELEG 2013) and (INEG 3313 or STAT 3013).

**ELEG4270L Electronics Manufacturing Processes Laboratory (FA, SP, SU)** Corequisite: ELEG 4273.

**ELEG4283 Mixed Signal Test Engineering I (FA, Even years)** Overview of mixed signal testing, the test specification process, DC and parametric measurements, measurement accuracy, tester hardware, sampling theory, DSP-based testing, analog channel testing, digital channel testing. Prerequisite: senior or graduate standing.

**ELEG4293 Mixed-Signal Modeling & Simulation (SP)** Study of basic analog, digital & mixed signal simulation solution methods. Modeling with hardware description languages. Use of state-of-the-art simulators and HDLs. Prerequisite: ELEG 3223

**ELEG4323 Switch Mode Power Conversion (FA, SP, SU)** Basic switching converter topologies: buck, boost, buck-boost, Cuk, flyback, resonant; pulse-width modulation; integrated circuit controllers; switching converter design case studies; SPICE analyses of switching converters; state-space averaging and linearization; switching converter transfer functions. Prerequisite: ELEG 3223 and ELEG 3123.

**ELEG4403 Control Systems (FA, SP, SU)** Mathematical models of control systems. Performance criteria and stability. Ziegler-Nichols, root-locus, and frequency-response design techniques. Special topics. Credit may be for only one of CSEG 4403 and ELEG 4403 or MEEG 4213. (Same as CENG 4403, CSEG 4403, MEEG 4213) Prerequisite: ELEG 3123.

**ELEG4463L Control Systems Laboratory (FA, SP, SU)** Experimental study of various control systems and components. The use of programmable logic controllers in the measurement of systems parameters, ladder-logic applications, process-control applications, and electromechanical systems. Prerequisite: ELEG 4403.

**ELEG4503 Electric Power Distribution Systems (FA, SP, SU)** Design considerations of electric power

distribution systems, including distribution substations, primary and secondary circuits. Distribution transformer and capacitor applications, voltage regulation, and distribution system protection. Prerequisite: ELEG 3303.

**ELEG4513 Power System Analysis (FA, SP, SU)** Equivalent circuit representation of power transmission lines. Development of power transmission network equations including symmetrical component method for unbalanced 3-phase circuits. Introduction to the problems of load flow, fault analysis, and transient stability. Prerequisite: ELEG 3123 or ELEG 3903.

**ELEG4523 Introduction to Power Electronics (FA, SP, SU)** Power electronic systems, power semiconductor switches, Generic power electronic converters: line-frequency diode rectifiers, line-frequency phase-controlled rectifiers and inverters, switch-mode inverters, and zero-voltage and zero-current switching resonant inverters (e.g., resonant and actively-clamped resonant dc-link inverters). Prerequisite: ELEG 3123 and ELEG 3223.

**ELEG4533 Fundamentals of Electromagnetic Compatibility in Power Electronics (IR)** EMI, EMC basics, EMI sources, differential- and common-mode EMI, EMI/EMC Standards, EMI Measurements, EMI/EMC Solutions. Corequisite: ELEG 3303. Prerequisite: ELEG 2113, ELEG 3223.

**ELEG4603 Deterministic Digital Signal Processing System Design (FA)** Design of Digital Signal Processing systems with deterministic inputs. Sampling, quantizing, oversampling, ADC trade-offs, distortion, equalizers, anti-aliasing, coherency, frequency domain design, audio and video compression. Prerequisite: ELEG 3133.

**ELEG4623 Communication Systems (FA, SP, SU)** Various modulation systems used in communications. AM and FM fundamentals, pulse modulation, signal to noise ratio, threshold in FM, the phase locked loop, matched filter detection, probability of error in PSK, FSK, DPSK. The effects of quantization and thermal noise in digital systems. Information theory and coding. Prerequisite: ELEG 4133.

**ELEG4683 Introduction to Image Processing (FA, SP, SU)** Introduction to the basic concepts of image processing; theory and applications. Covers digital methods of image restoration; reformation, extraction and analysis. (Same as CSEG 4683) Corequisite: CSEG 4680D.

**ELEG4680D Introduction to Image Processing Drill (FA, SP, SU)** Corequisite: ELEG 4683.

**ELEG4713 Electromagnetic Transmission (FA, SP, SU)** Steady state and transient response of lossless and dissipative transmission lines. Wave guides and resonators. Antennas and radiation. Prerequisite: ELEG 3703.

**ELEG4723 Introduction to RF and Microwave Design (FA)** 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. Prerequisite: ELEG 3703.

**ELEG487V Special Topics in Electrical Engineering (1-3) (IR)** Consideration of current electrical engineering topics not covered in other courses. May be repeated for 6 hours. Prerequisite: senior standing.

**ELEG488V Special Problems (1-3) (FA, SP, SU)** Individual study and research on a topic mutually agreeable to the student and a faculty member. Prerequisite: senior standing.

**ELEG489V Special Projects (1-3) (FA, SP, SU)** Design and construction of a project mutually agreeable to the student and a faculty member. Prerequisite: senior standing.

**ELEG4933 Minicomputer Applications (FA, SP, SU)** Structure, implementation, and application of minicomputer systems. Microcomputer hardware. Microprogramming. Minicomputer software technology. Design and evaluation of minicomputer systems. (Same as CSEG 4953) Corequisite: ELEG 4930D. Prerequisite: CENG 1123 or CSCE 1123.

**ELEG4930D Minicomputer Applications Drill (FA, SP, SU)** Corequisite: ELEG 4933.

**ELEG4943 Digital Systems Design (FA, SP, SU)** Number systems and codes, fundamentals of switching algebra, analysis and design of sequential switching circuits and memory elements. (Same as CSEG 4943) Prerequisite: junior standing.

**ELEG4963 Field Programmable Gate Array Laboratory (FA, SP, SU)** Implementation of digital logic and state machine designs with field programmable gate

arrays. Emphasis is on the use of CAD tools for design and synthesis. Corequisite: ELEG 4960L.

**ELEG4960L Field Programmable Gate Array Laboratory Lab** (FA, SP, SU) Corequisite: ELEG 4963.

**ELEG4983 Introduction to Computer Architecture** (FA, SP, SU) Design of a single board computer including basic computer organization, memory subsystem design, peripheral interfacing, DMA control, interrupt control, and bus organization. (Same as CSEG 4983) Prerequisite: ELEG 3923.

**ELEG5113 Stochastic Digital Signal Processing System Design** (SP) Design elements and trade-offs of stochastic DSP systems. Linear prediction, adaptive filters, parametric spectral analysis, speech applications. Design examples, random signal basics, spectral decomposition, noise. Prerequisite: ELEG 3133 and ELEG 4133.

**ELEG5153 Real-Time Data Acquisition Systems** (FA, SP, SU) The theory and practice associated with taking measurements of the real world for use with computers. Sampling and data analysis techniques. (Same as CSEG 5053) Prerequisite: ELEG 3923.

**ELEG5163 Advanced Microcontroller Design Project** (FA, SP, SU) Use of development systems as an aid to microcontroller design; the student is expected to design, build, and test a microcontroller-based system to perform a specified task. Corequisite: ELEG 5160L. Prerequisite: ELEG 3923.

**ELEG5160L Advanced Microcontroller Design Laboratory** (FA, SP, SU) Corequisite: ELEG 5163.

**ELEG5173L Digital Signal Processing Laboratory** (FA, SP, SU) 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, filters. Prerequisite: ELEG 4603.

**ELEG5183L DSP Digital Communications Laboratory** (SU) Implementation of digital communication techniques in the Texas Instruments C30 processor. AM, FM, SSB, DSB modulation; data scramblers, bit error rate, PAM, QAM; echo cancellation, full-duplex modems. Pre- or Corequisite: ELEG 4623.

**ELEG5193L Advanced DSP Processors Laboratory** (SP) Familiarization with, and use of, advanced DSP processors. Parallel processor configurations, timing consideration, specialized programming techniques, complex pipelines. Prerequisite: ELEG 5173L.

**ELEG5213 Integrated Circuit Fabrication Technology** (FA, SP, SU) 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.

**ELEG5233 Solid-State Electronics I** (FA, SP, SU) Theoretical treatment of crystal structures and lattices, quantum and statistical mechanics, thermal properties of crystals, free-electron theory of metals and quantum theory of electrons in periodic lattices. Prerequisite: ELEG 4203 and PHYS 3614 and PHYS 3611L.

**ELEG5253L Integrated Circuit Design Laboratory I** (FA, SP, SU) Design and layout of large scale digital integrated circuits. Students design, check, and simulate digital integrated circuits that 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 and ELEG 4203.

**ELEG5263L Integrated Circuit Design Laboratory II** (FA, SP, SU) Students test the I.C. chips they designed in I.C. Design Laboratory I and propose design corrections where needed. Topics include gate arrays, bipolar design, I2L, memory design, and microprocessor design. Prerequisite: ELEG 5253L.

**ELEG5273 Electronic Packaging** (FA, SP, SU) An introductory treatment of electronic packaging from single chip to multichip including materials, electrical design, thermal design, mechanical design, package modeling and simulation, processing considerations, reliability, and testing. Credit can not be earned for both MEEG 5273 and ELEG 5273. (Same as MEEG 5273) Prerequisite: (ELEG 3213 or ELEG 3913) and MATH 3404.

**ELEG5283 Mixed Signal Test Engineering II** (SP, Odd years) Focus calibrations, DAC testing, ADC testing, DIB design, Design for Test, Data Analysis, Test Economics. Prerequisite: ELEG 4283.

**ELEG5293L Integrated Circuits Fabrication Laboratory** (FA, SP, SU) 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.

**ELEG5313 Power Semiconductor Devices** (FA, SP, SU) 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.

**ELEG5403 Systems Theory** (FA, SP, SU) A unified state-space approach to continuous and discrete systems. System dynamics, local transition functions, reachability, observability, and global behavior of systems. Prerequisite: ELEG 4403.

**ELEG5413 Stochastic Control Systems** (FA, SP, SU) Optimal estimation and control of linear dynamic systems with uncertainties. Stochastic processes and models. Prediction, filtering, and smoothing. The Kalman filter, Wiener-Hopf equations, separation principle, and stochastic optimal control. Prerequisite: ELEG 4133.

**ELEG5423 Optimal Control Systems** (FA, SP, SU) Basic concepts, conditions for optimality, the minimum principle, the Hamilton Jacobi equation, structure and properties of optimal systems. Prerequisite: ELEG 4403.

**ELEG5433 Digital Control Systems** (FA, SP, SU) Signal processing in continuous-discrete systems. System modeling using the z-transform and state-variable techniques. Analysis and design of digital control systems. Digital redesign for continuous control. Prerequisite: ELEG 4403.

**ELEG5443 Nonlinear Systems Analysis and Control** (FA, SP, SU) Second-order nonlinear systems. Nonlinear differential equations. Approximate analysis methods. Lyapunov and input-output stability. Design of controllers, observers, and estimators for nonlinear systems. (Same as MATH 5443) Prerequisite: ELEG 4403 or MATH 5303.

**ELEG5453 Adaptive Filtering and Control** (FA, SP, SU) Models for deterministic systems. Parameter estimation. Adaptive control. Stochastic models. Stochastic state and parameter estimation. Adaptive control of stochastic systems. Prerequisite: ELEG 3143 and ELEG 4403.

**ELEG5463 Chaotic Dynamical Systems** (SU) Computer analysis of fixed and periodic orbits and bifurcations. Symbolic dynamics approach to chaotic systems with applications to convergence analysis of numerical algorithms and secure communications. Fractals with applications to image compression. Julia and Mandelbrot sets. Prerequisite: senior or graduate standing in Engineering, Math or Science.

**ELEG5473 Intelligent Transportation Systems** (SU) Engineering challenges in current surface transportation. The ITS concept. Review of current electrical, communication, and computer technologies. Applications to traffic surveillance, traveler information, traffic management, transit management, incident management, automatic toll collection and smart cars. Benefits to ITS. Prerequisite: senior or graduate standing in engineering.

**ELEG5513 Electric Power Quality** (FA, SP, SU) The theory and analysis of electric power quality for industrial and commercial power systems. Specific topics include: grounding, shielding, wiring considerations, instrumentation, site surveys and analysis, case studies, specification and selection of power system components, and recommended design and installation practice. Prerequisite: ELEG 3303 and MATH 3404.

**ELEG5533 Power Electronics and Motor Drives** (FA, SP, SU) V-1 characteristics of insulated Gate Bipolar Transistors (IGBTs) and MOS-controlled Thyristors (MCTs), design of driver and snubber circuits, induction-, permanent magnet-, and brushless dc-motor drives; and resonant inverters. Prerequisite: graduate standing or (ELEG 3223 and ELEG 3303).

**ELEG5543 Communication Networks for Motion/Industrial Control** (IR) An introduction to topics of current interest in motion control systems. Examples: Open Control Automation, RS 485 Communication and RS 232 Communication as related to motion control systems, Serial Real Time Communication Systems, Control Area Network, Embedded Controllers, Motion Control Applications. Prerequisite: ELEG 3303 or graduate standing.

**ELEG5613 Introduction to Telecommunications** (FA) Overview of Public and Private Telecommunication Systems; Traffic Engineering; Communications Systems Basics, Information Technology, Electromagnetics, Data

Transmission" (Same as CSCE 5613) Prerequisite: ELEG Graduate Standing or ELEG 3133.

**ELEG5623 Information Theory** (FA, SP, SU) Continuous and discrete source and channel models, measure of information, channel capacity, noisy-channel coding theorem, coding and decoding techniques. Prerequisite: ELEG 4133 or ELEG 4623.

**ELEG5633 Detection and Estimation** (FA, SP, SU) 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.

**ELEG5643 Computer Communications Networks** (FA, SP, SU) A study of various current data communication techniques used in the computer world. Concepts of digital communications theory as well as packets and protocols are studied. (Same as CSEG 5083) Prerequisite: CSEG 2533.

**ELEG5653 Artificial Neural Networks** (SU) Fundamentals of artificial neural networks, both theory and practice. Teaches basic concepts of both supervised learning, and how they are implemented using artificial neural networks. Topics include the perceptron, back propagation, the competitive Hamming net, self organizing feature maps, topological considerations, requirements for effective generalization, subpattern analysis, etc. Prerequisite: MATH 3403.

**ELEG5673 Pattern Recognition** (FA, SP, SU) Introduction to the basic concepts of pattern recognition, its theory and application. Subjects will include: trainable pattern classifiers, discriminant functions, parametric training methods, nonparametric training methods, feature selection, feature ordering, cluster analysis. Prerequisite: ELEG 4133.

**ELEG5683 Image Processing** (FA, SP, SU) Concepts involved in the processing of digital images. Emphasis on image analysis, enhancement, and restoration. Both spatial and frequency domain approaches are presented. (Same as CSEG 5203) Prerequisite: working knowledge of statistics and a programming language.

**ELEG5693 Wireless Communications** (FA) 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.

**ELEG5713 Antennas and Radiation** (FA, SP, SU) Radio frequency antennas, control of radiation patterns, antenna impedance and antenna feeding systems. Prerequisite: ELEG 3713.

**ELEG5723 Advanced Microwave Design** (SP) 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 3703 and ELEG 4723.

**ELEG5733 Remote Sensing Systems** (FA, SP, SU) Analysis of remote sensors operating in 3 widely used EM spectral regions: Visible and near IR, thermal IR, and microwave. Emphasis on understanding generic types of remote sensors serving these spectral bands, their data products, and applications. Prerequisite: ELEG 3703 and ELEG 3123.

**ELEG5743 Radar Systems** (FA, SP, SU) Methods of discrimination and ambiguity in the measurement of range, angle and velocity. Analysis of search, tracking, MTI, SLAR, and SAR systems. Characterization of return from complex targets. Prerequisite: ELEG 3713.

**ELEG5753 Satellite Communications & Navigation Systems** (FA) Introduces satellite communications and navigation systems design including microwave transmission, satellite transponders, earthstation hardware, modulation and multiple access techniques, and satellite networks. Prerequisite: ELEG 3133 and ELEG 3703.

**ELEG5801 Graduate Seminar** (FA, SP, SU) Papers presented by candidates for the Master of Science degree in electrical engineering on design problems, or new developments in the field of electrical engineering.

**ELEG587V Special Topics in Electrical Engineering (1-3)** (FA, SP, SU) Consideration of current electrical engineering topics not covered in other courses. Prerequisite: graduate standing.

**ELEG588V Special Problems (1-6)** (FA, SP, SU) Opportunity for individual study of advanced subjects related to a graduate electrical engineering program to suit individual requirements.

**ELEG5913 Parallel Programming** (FA, SP, SU) An



analysis of parallel computer systems with respect to software engineering. Practical programming experience on pipelined, array, and multiprocessor computers. Credit can be earned in only one of these three courses. CSCE 5303 or CSEG 5303 or ELEG 5913. (Same as CSCI 5303, CSEG 5303)  
Prerequisite: working knowledge of 'C' language and CSEG 4513 or equivalent.

**ELEG5933 CAD Methods for VLSI** (FA, SP, SU) Introduction to computational methods for the design and implementation of computer aided design (CAD) tools for digital systems engineering. The underlying theory of the tools is emphasized in addition to their application. Prerequisite: proficiency using a modern high-level programming language and CSEG 4983.

**ELEG5943 Computer Arithmetic Circuits** (FA, SP, SU) 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. Pre- or Corequisite: CSEG 4983 or equivalent and graduate standing.

**ELEG5963 Computer Systems Optimization** (FA, SP, SU) Design considerations and performance analysis of computer and communication systems modeling. (Same as CSEG 5063) Prerequisite: CSEG 2723.

**ELEG600V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**ELEG6213 Semiconductor Surfaces** (FA, SP, SU) Semiconductor surfaces: Structure and reactivity of the surface, surface space-charge region, surface states, scattering. Experimental methods, the MOS capacitance vs. voltage technique, current-voltage measurements, photo-electric emission. Prerequisite: ELEG 5233.

**ELEG6233 Solid State Electronics II** (FA, SP, SU) In-depth theoretical treatment of semiconductor material and devices. Topics to be covered include carrier statistics, transport behavior, bulk material properties, junction characteristics and metal-semiconductor contacts. Prerequisite: ELEG 5233.

**ELEG6273 Advanced Electronic Packaging** (FA, SP, SU) An advanced treatment of electronic packaging concentrating on multichip modules. Topics covered include electrical design, thermal design, mechanical design, package modeling and simulation, computer-aided engineering and design, processing limitations on MCM performance, reliability, testing, and economic considerations. (Same as MEEG 6273) Prerequisite: ELEG 5273.

**ELEG6801 Graduate Seminar** (FA, SP, SU) Papers presented by candidates for the Doctor of Philosophy degree in electrical engineering on current research or design problems in the field of electrical engineering.

**ELEG700V Doctoral Dissertation (1-18)** (FA, SP, SU)

## (ENDY) ENVIRONMENTAL DYNAMICS

**ENDY4043 Water Resource Issues** (SP) Human impact on the quantity and quality of water resources including impact of agriculture, industrial, and municipal uses, and a comparative policies and water resource development, past and present.

**ENDY5023 Digital Remote Sensing** (SP) Theoretical and applied aspects of the manipulation and interpretation of environmental phenomena recorded by digital remote sensing instruments. Emphasis is on techniques of digital image enhancement and transformation, image geocoding & supervised & unsupervised classification of multispectral image data from Earth-orbiting platforms. Prerequisite: GEOL 4413 or equivalent.

**ENDY5033 Advanced Geographic Information Systems** (SP) Advanced vector operations and analysis. Topics include topological analysis, network analysis, geocoding, conflation, implications of source and product map scale, map generalization, error mapping, and cartographic production. Prerequisite: (ANTH 4563 or GEOL 4563) or equivalent.

**ENDY5043 GIS Analysis and Modeling** (SP, Odd years) Advanced raster topics are examined with a theoretical and methodological review of Tomlin's cartographic modeling principles. Topics vary and include fourier methods, image processing, kriging, spatial statistics, principal components, fuzzy and regression modeling, and multi-criteria decision models. Several raster GIS programs are examined with links to statistical analysis software. Prerequisite: (ANTH 4553 or GEOG 4553) or equivalent.

**ENDY5053 Quaternary Environments** (FA) An

interdisciplinary study of the Quaternary Period including dating methods, deposits soils, climates, tectonics and human adaptations.

**ENDY5063 Paleoclimatology** (SP) The earth's climate history over the last 2 million years and the influence various factors have had on it; compilation and paleoclimatic histories and methods of dating climatic effects. Prerequisite: GEOG 4363 or equivalent.

**ENDY5113 Global Change** (FA) 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. Prerequisite: graduate standing.

**ENDY5153 Environmental Site Assessment** (IR) Principles, problems, and methods related to conducting an environmental site assessment. An applied course covering field site assessment, regulatory documentation, and report preparation. Prerequisite: GEOL 4033.

**ENDY5533 Marine Geology** (SP) Geological principles as applied to the study of the world's ocean basins. Course includes basic theories of ocean basin evolution, continental margin evolution, coastal geologic processes, and methods of study of deep sea records of global change and paleoceanography. Prerequisite: graduate standing.

**ENDY6013 Environmental Dynamics** (IR) 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.

**ENDY6023 Seminar in Environmental Dynamics** (IR) Seminar examining specific contemporary topic of topics in Environmental Dynamics. Topics will change with each offering. May be repeated for 6 hours. Prerequisite: graduate standing.

**ENDY689V Special Problems in Environmental Dynamics (1-6)** (FA, SP, SU) Independent study of a topic related to environmental dynamics under the guidance of an ENDY faculty member. May be repeated for 6 hours.

**ENDY6991 Environmental Dynamics Colloquium** (FA, SP) 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. May be repeated for 6 hours.

**ENDY700V Doctoral Dissertation (1-18)** (FA, SP, SU) May be repeated for 18 hours. Prerequisite: graduate standing.

## (ENGL) ENGLISH

**ENGL0003 Basic Writing** (FA, SP) A required course for first-time entering freshmen whose placement-test scores indicate that they are not prepared for ENGL 1013. Upon the recommendation of the Department of English, students may possibly be exempted from this course and transferred to ENGL 1013 as the result of further testing during the first week of classes. Credit earned in this course may not be applied to the total required for a degree.

**ENGL1013 Composition I** (FA, SP, SU) Required of all freshmen unless exempted by the Department of English. Prerequisite is an acceptable score on the English section of the ACT or on another approved test or ENGL 0003. Prerequisite: ENGL 0003 or an acceptable score on the English section of the ACT or another approved test.

**ENGL1013H Honors Composition I** (FA) A course for freshmen with high placement scores.

**ENGL1023 Composition II** (FA, SP, SU) Continuation of ENGL 1013.

**ENGL1023H Honors Composition II** (SP) Continuation of ENGL 1013H.

**ENGL1153 Vocabulary Building** (IR) Designed to increase the student's vocabulary and thereby improve reading comprehension, writing, and knowledge of the operations of language. Also includes study of how words have been added to the English Language in the past, study of patterns of word formation, and study of lexicography. Some attention given to pronunciation and spelling. Not a remedial course.

**ENGL1213 Introduction to Literature** (FA) Approaches to reading and writing about fiction, drama, and poetry at the college level.

**ENGL2003 Advanced Composition** (FA, SP, SU)

Review course in English composition. Required of all candidates for bachelor's degree unless exempted by examination or by credit in ENGL 2013 or by a grade of at least a "B" in ENGL 1013 and a grade of "A" in ENGL 1023 at the University of Arkansas, Fayetteville. Not to be taken before the second semester of the sophomore year; must be taken prior to the last semester before graduation. Cannot be counted toward a major in English. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2013 Essay Writing** (SP, SU) Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2023 Creative Writing I** (FA, SP) Beginning level workshop course in which students write original poems and stories. Reading and detailed discussion of poems and stories in anthologies is required. Designed to teach the student the fundamental techniques of fiction and poetry. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2113 English Literature from the Beginning to 1798** (FA, SP) Survey of English literature from Anglo-Saxon times to the beginning of the Romantic Movement. Prerequisite: ENGL 1013 and ENGL 1023 or equivalent.

**ENGL2123 English Literature from 1798 to the Present** (FA, SP) Survey of English literature from the Romantic Movement to the present. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2133 History of Literature in English I** (FA, SP, SU) A critical and historical survey of the development of literature in English from its beginnings to the Restoration period. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2143 History of Literature in English II** (FA, SP, SU) A critical and historical survey of the development of literature in English in both Great Britain and the United States, from the Restoration to the rise of Romanticism. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2153 History of Literature in English III** (FA, SP, SU) A critical and historical survey of the development of literature in English, in both Great Britain and the United States, from Romanticism to Modernism. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2163 History of Literature in English IV** (FA, SP, SU) A critical and historical survey of literature in English from Modernism to the present, including literature from English-speaking countries other than Great Britain and the United States. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL2253 Practical Criticism** (FA) Introduction to applied literary criticism; study of theories and techniques of critical analysis. Prerequisite: ENGL 1013 and ENGL 1023.

**ENGL3013 Creative Writing II** (FA, SP) Laboratory course for students who wish to attempt original work in the various literary forms. Prerequisite: ENGL 2023 or equivalent.

**ENGL3053 Technical and Report Writing** (FA, SP) Intensive practice in such types of writing as processes, descriptions of mechanism, abstracts, and laboratory and research reports. The criteria for effective written exposition in the scientific areas, including agriculture and engineering.

**ENGL3113 Folklore** (IR) Popular literature (ballads, folktales, etc.). Prerequisite: junior standing.

**ENGL3123 Folk and Popular Music Traditions** (IR) Introduction to folk and popular music studies. Emphasis on American traditions. Prerequisite: ENGL 3113.

**ENGL3173 Introduction to Linguistics** (IR) Introduction to language study with stress upon modern linguistic theory and analysis. Data drawn from various languages reveal linguistic universals as well as phonological, syntactic, and semantic systems of individual languages. Related topics: language history, dialectology, language and its relation to culture and society, the history of linguistic scholarship. (Same as ANTH 3173, COMM 3173) Prerequisite: junior standing.

**ENGL3183 Modern English Syntax and Style** (SP) Structure of modern English (from 1500 to the present), with emphasis upon the contemporary period; different grammatical systems (such as traditional, structural, and generative-transformational) and the analysis of style; some emphasis upon dialects, place names, and specific lexical and structural differences between standard and non-standard English.

**ENGL3193 History of the English Language** (FA) Introduction to the English language and its vocabulary from Anglo-Saxon times to the present.

**ENGL3203 Poetry** (FA, SP) A critical introduction to the genre.

**ENGL3213 Fiction** (FA, SP) A critical introduction to the genre.



**ENGL3223 Drama (SP)** A critical introduction to the genre.

**ENGL3233 Literature and Eros (IR)** Survey of important works from the classical Greeks to contemporary literature that deal with the erotic experience. Study of various theories and cultural definitions of eroticism, especially as distinct from clinical sexuality and romantic sentimentality.

**ENGL3243 Humor and Satire (IR)** Study of humorous and satirical works in various genres from various periods of English and American literature.

**ENGL3253 Literary Criticism (IR)** The history of literary theories and methods from Plato to the present.

**ENGL3273 European Short Story (IR)** The short story as practiced by the European masters of the 19th and 20th centuries; short stories (in translation) representative of a number of countries and a wide variety of types.

**ENGL3303 Major American Writers (FA, SP)** Selected works of prose, poetry, and drama by major American writers from early times to the present.

**ENGL3313 American Literature to the Civil War (FA, SP, SU)** Major American writers of prose, poetry, and drama from Colonial times to the Civil War period.

**ENGL3323 American Literature Since the Civil War (FA, SP, SU)** Major American writers of prose, poetry, and drama from the Civil War to the present.

**ENGL3343 The American Short Story (FA, SP, SU)** Development of the American short story from its beginnings to the present day.

**ENGL3363 The American Novel (IR)** A survey of the development of the American novel from its origins to the present.

**ENGL3433 Introduction to Chaucer (IR)** Course designed primarily for undergraduates. Extensive reading in Chaucer's major works.

**ENGL3613 Elizabethan and Jacobean Literature (IR)** Selected works of poetry, drama, fiction, and non-fiction prose of the sixteenth and earlier seventeenth centuries.

**ENGL3623 The Bible as Literature (IR)** The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms.

**ENGL3653 Introduction to Shakespeare (FA, SP, SU)** Extensive reading in Shakespeare's comedies, histories, tragedies, and nondramatic poetry.

**ENGL3703 Literature of the English Enlightenment (IR)** Major works of English literature from 1660 to 1800.

**ENGL3813 Victorian and Modern Literature (IR)** A survey of the literature of Britain since the accession of Queen Victoria.

**ENGL3823 The British Novel to 1900 (IR)** History and development of the British novel from the beginning through the nineteenth century.

**ENGL3913 Women and Modern Literature (IR)** Explores the roles of women in British and American literature. Emphasis placed on novels and poetry by women that deal with the problems of women writers. The possibilities and limitations of feminist criticism are also explored.

**ENGL3923H Honors Colloquium (IR)** Covers a special topic or issue. Offered as part of the honors program. May be repeated. Prerequisite: honor candidacy (not restricted to candidacy in English).

**ENGL398V Special Studies (1-3) (IR)** A course (not independent study) that covers a topic or author not usually presented in depth in regular courses. May be repeated.

**ENGL399VH Honors Course (1-6) (IR)** May be repeated for 12 hours. Prerequisite: junior standing.

**ENGL4003 English Language and Composition for Teachers (FA)** Subject matter and methods of approach for the teaching of composition in high school.

**ENGL4013 Undergraduate Poetry Workshop (IR)** For advanced students. Gives close attention to individual manuscripts in a workshop environment.

**ENGL4023 Undergraduate Fiction Workshop (IR)** For advanced students. Gives close attention to individual manuscripts in a workshop environment.

**ENGL4073 Film Writing Workshop (IR)** A workshop in writing the screenplay with close attention given to student manuscripts and adaptations. Prerequisite: advanced standing.

**ENGL4113 Undergraduate Independent Study (IR)** Undergraduate original research and writing.

Prerequisite: 'B' average and two-thirds (21 hours or regular requirements for English major completed).

**ENGL4123 Language and Public Policy (IR)**

Semantic distortion in politics and commerce-mass media, government, professional jargon, language of sexism, classism, war, etc.

**ENGL4143 American Film Survey (IR)** A survey of major American genres, major directors, and films that have influenced the development of motion pictures. (Same as COMM 4143)

**ENGL4173 Backgrounds of English Literature (IR)**

Backgrounds of English literature that will be of particular value to teachers. Extensive use of slides, films, and recordings to acquaint the student with various movements, ideas, events, and influences that constitute the cultural context for the literary works.

**ENGL419V Literature in Relation to Other Disciplines (1-3) (IR)** Relationships between literature and such related fields as science, politics, psychology, history, and art. May be repeated for 6 hours.

**ENGL4213 Senior Research Seminar (IR)**

Seminar on a topic in literature in English with a substantial research paper required.

**ENGL4223H Honors Senior Seminar (IR)** Seminar on a topic in literature in English with a substantial research paper required. Restricted to students enrolled in either departmental or Fulbright College honors program.

**ENGL4253 African Literature (IR)** 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.

**ENGL4323 American Realism and Naturalism (IR)**

American poetry and fiction between the Civil War and World War I. The origins and characteristics of Realism and Naturalism are discussed, and the relationship between the schools examined. Authors include Mark Twain, James, Howells, Dunbar, Chopin, Crane, Chesnut, Wharton, Freeman, Robinson, Dreiser, Garland, and others.

**ENGL4333 African American Literature (IR)**

Historical and critical survey of African American literature in its social and cultural context.

**ENGL4343 The Modern Southern Novel (IR)**

Examination of the works of such authors as Faulkner, McCullers, O'Connor, Warren, and Wolfe both as works of art and as representative products of a significant cultural region.

**ENGL4363 Modern American Poetry from 1900 to 1960 (IR)** Twentieth-century American poetry from Frost and Eliot to 1960.

**ENGL4383 Literature of the South (IR)** Literature about the South by Southern writers in America from the Colonial period to the present.

**ENGL4433 Middle English Literature (IR)** English literature (other than the works of Chaucer) from 1200 to 1500.

**ENGL4713 Eighteenth-Century Literature to 1750 (IR)**

Poetry, drama, the essay, and prose fiction from 1700 to 1750.

**ENGL4723 Eighteenth-Century Literature After 1750 (IR)**

Poetry, drama, the essay, and prose fiction from 1750 to 1800.

**ENGL4813 Poetry of the Romantic Period (IR)**

**ENGL4833 Poetry of the Victorian Period (IR)**

**ENGL4853 British Literature of the Nineteenth Century (IR)**

Selected major works of poetry, drama, fiction, and non-fiction prose of the nineteenth century.

**ENGL4903 British Short Story (IR)** Survey of the British short story in the nineteenth and twentieth centuries, with emphasis on the major writers.

**ENGL4913 Contemporary American and British Poetry (IR)** American and British poetry since 1940.

**ENGL4923 Modern World Drama (IR)** Drama from Ibsen to the 1930s.

**ENGL4933 Contemporary American and British Novel (IR)** English and American novels since 1940.

**ENGL4943 Modern British Novel (IR)** The novel in England and Ireland from 1900 to 1940.

**ENGL4963 Contemporary World Drama (IR)** Drama since the 1930s.

**ENGL4973 Twentieth-Century Non-Fiction Prose (IR)**

Twentieth century non-fiction prose as literature; selected works such British and American writers as H. Adams, Agee, Capote, Cleaver, Hemingway, Lawrence, C.S. Lewis, Mailer, Orwell, Stein, and Woolf.

**ENGL498V Senior Thesis (1-6) (IR)**

**ENGL4993 Modern British Literature (IR)** Poetry, drama, fiction, and the essay from 1890 to 1940.

**ENGL5003 Composition Pedagogy (FA)**

Introduction to teaching college composition. Designed for graduate assistants at the University of Arkansas.

**ENGL5013 Creative Writing Workshop (IR)**

**ENGL5023 Writing Workshop: Fiction (IR)**

**ENGL5033 Writing Workshop: Poetry (IR)**

**ENGL5043 Translation Workshop (IR)** 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. May be repeated for 15 hours. Prerequisite: reading knowledge of a foreign language.

**ENGL5063 Internship in Publishing (IR)** Practical experience and instruction in copyediting and stylistics, promotional copywriting, and production. Conducted at the University of Arkansas Press and designed for students who plan careers in publishing. May be repeated for 6 hours.

**ENGL507V Creative Non-Fiction Workshop (1-3) (IR)**

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.

**ENGL5083 Professing Literature (IR)** An introduction to the profession of literary scholarship and the teaching of literature at the college level.

**ENGL510V Readings in English and American Literature (1-6) (IR)** Open to Honors candidates and graduate students. May be repeated.

**ENGL5143 English Teachers' Workshop: Literature (IR)**

Primarily for high school teachers of English. Review of principles of literary criticism, literary movements; intensive study of representation works from each genre.

**ENGL5173 Studies in Medieval Literature and Culture (IR)**

Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5183 The Structure of Present English (SP)**

Structural analysis of the language.

**ENGL5203 Introduction to Graduate Studies (IR)**

Students learn to carry out and report on literary research. Practical assignments introduce them to the reference collections, professional journals, and microform texts with which scholars work. Meanwhile, advanced explication and composition exercises work on perfecting the students' control over the design and style of the articles they write.

**ENGL5223 Studies in Renaissance Literature and Culture (IR)**

Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5233 Form and Theory of Translation (IR)**

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.

**ENGL5243 Special Topics (IR)** Designed to cover subject matter not offered in other courses. May be repeated.

**ENGL5263 Form and Theory of Fiction: I (IR)**

Such aspects of the genre as scene, transition, character, and conflict. Discussion is limited to the novel.

**ENGL5273 Form and Theory of Poetry: I (IR)** An examination of perception, diction, form, irony, resolution, and the critical theories of the major writers on poetry, such as Dryden, Coleridge, and Arnold.

**ENGL5283 Form and Theory of Fiction: II (IR)**

Second part of the study of the techniques of fiction. Discussion is limited to the short story. Prerequisite: ENGL 5263.

**ENGL5293 Form and Theory of Poetry: II (IR)**

Second part of the study of the techniques of poetry; independent study of a poet or a problem in writing or criticism of poetry. Prerequisite: ENGL 5273.

**ENGL5303 Seminar in Restoration and Eighteenth-Century British Literature and Culture (IR)**

Subject matter changes depending on

student interest and faculty expertise. May be repeated.

**ENGL5313 Introduction to Literary Theory (IR)**  
An advanced introductory survey of a number of theoretical approaches to literature.

**ENGL5403 Studies in Nineteenth-Century British Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5603 World Literature and Culture in English (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5623 The Bible as Literature (IR)** The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms.

**ENGL5633 English Drama from Its Beginning to 1642 (IR)** Early forms, Tudor drama, Shakespeare's contemporaries, and Stuart drama to the closing of the theatres.

**ENGL5653 Shakespeare: Plays and Poems (IR)**

**ENGL569V Seminar in Film Studies (1-9) (IR)** 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, the film musical. (Same as COMM 569)

**ENGL5703 Studies in American Literature and Culture Before 1900 (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5723 Studies in Literature and Culture of the American South (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5803 Studies in Twentieth-Century American Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5903 Studies in Twentieth-Century British Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5923 Film and Media Studies (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5933 Studies in Popular Culture and Popular Genres (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5943 Studies in Criticism and Literary Theory (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5953 Studies in Literary History (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL5973 Studies in Rhetoric and Composition (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6113 Seminar in Medieval Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6193 The Development of English (FA)** Intensive course in the fundamentals of linguistic study and their application to the history of English from prehistoric times to the present.

**ENGL6203 Seminar in Renaissance Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6243 Seminar in Special Topics (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6443 Seminar in Nineteenth-Century British Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6513 Seminar in Twentieth-Century British Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6613 Seminar in World Literature and Culture in English (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6713 Seminar in Restoration and Eighteenth-Century British Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6723 Seminar in American Literature and Culture Before 1900 (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6733 Seminar in Literature and Culture of the American South (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6803 Seminar in Twentieth-Century American Literature and Culture (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6933 Seminar in Popular Culture and Popular Genres (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6943 Seminar in Literary Theory (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6953 Seminar in Literary History (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL6973 Seminar in Rhetoric and Composition (IR)** Subject matter changes depending on student interest and faculty expertise. May be repeated.

**ENGL698V Master's Thesis (1-6) (FA, SP, SU)**

**ENGL699V Master of Fine Arts Thesis (1-6) (FA, SP, SU)**

**ENGL700V Doctoral Dissertation (1-18) (FA, SP, SU)**

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## (ENSC) ENVIRONMENTAL SCIENCE

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**ENSC1003 Environmental Science (SP)** Series of lectures and discussions introducing the topic of environmental science including factors related to water, soil, and air quality. May not be taken for natural science credit by students in Fulbright College.

**ENSC1012 Orientation to Crop, Soil, and Environmental Science (FA)** An introduction to majors in Crop Management and Environmental, Soil and Water Sciences with emphasis on issues in these disciplines and on developing academic abilities and communication skills. Required of all departmental majors with less than 24 semester credit hours. Recitation 2 hours per week.

**ENSC2203 Soil Science (FA, SP)** Origin, classification and physical, chemical, and biological properties of soils. Lecture 3 hours, discussion 1 hour per week. (Same as CSES 2203) Corequisite: CSES 2201L and CSES 2200D. Prerequisite: CHEM 1103.

**ENSC3023 Agricultural Waste Management (FA)** The types, natures, and volumes of agricultural wastes and the effect of these wastes on the environment. The control, management, and reuse of wastes to include final disposal. Lecture 3 hours per week. (Same as BAST 3023) Prerequisite: junior standing and MATH 1203.

**ENSC3103 Plants and Environmental Conservation (FA)** Selection, establishment, and use of plants to promote soil conservation and water quality. Principles and practices of managing plants for remediation of contaminated soils, erosion control, nutrient and sediment trapping, wetlands, and wildlife. Prerequisite: CSES 1203 or HORT 2003.

**ENSC3253 Septic Systems (SP, Odd years)** An overview of designing, installing, and monitoring standard and alternative septic systems as well as the rules and regulations that impact septic system design and installation. Recitation 3 hours per week. Prerequisite: CSES 2203 or CVEG 3213.

**ENSC3263 Environmental Soil and Water Conservation (SP)** Effect of land use on water quality. Major sources of agricultural nonpoint pollutants. Best management practices used to minimize water quality impacts. Corequisite: ENSC 3260L. Prerequisite: CSES 2203.

**ENSC3260L Environmental Soil and Water Conservation Lab (SP)** Corequisite: ENSC 3263.

**ENSC3413 Principles of Environmental Economics (FA)** An introductory, issues-oriented course

in the economics of the environment. What is involved in society making decisions about environmental quality will be studied. Environmental issues important to the State of Arkansas and the United States will be emphasized. Prerequisite: AGECE 1103 or ECON 2023.

**ENSC400V Special Problems (1-3) (FA, SP, SU)** Work on special problems in environmental science or related fields. May be repeated for 8 hours.

**ENSC4023 Water Quality (FA)** Physical, chemical, and biological characteristics of natural waters (rain, river, lake, soil, ground, etc.). Discussion of water quality parameters such as pH, alkalinity and acidity, redox, hardness, BOD, TSS, etc. Aquatic processes of pollutants and principles of modeling. Laboratory experiments in water sampling, measurement of water quality parameters, and instrumentation. Corequisite: ENSC 4020L. Prerequisite: CHEM 1123 and CHEM 1121L.

**ENSC4020L Water Quality Laboratory (FA)** Corequisite: ENSC 4023.

**ENSC4033 Water Quality Analysis (SP)** Lectures concerning evaluation of water quality parameters with complementary field and laboratory experiences. Principles of parameter selection, quality assurance and quality control, sampling protocols, field techniques, and instrumentation as well as laboratory analysis methodologies will be emphasized. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: ENSC 4023.

**ENSC404V Special Topics (1-3) (IR)** Studies of selected topics in environmental sciences not available in other courses.

**ENSC4263 Environmental Soil Science (SP)** Study of the behavior of pesticides, toxic organic compounds, metals, nutrients, and pathogenic microorganisms in the soil/plant/water continuum. Lecture 3 hours per week. (Same as CSES 4263) Prerequisite: CSES 3214.

**ENSC4413 Economics of Environmental Management (SP, Odd years)** 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. (Same as AGECE 4413) Prerequisite: AGECE 1103 and AGECE 3413.

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## (ENTO) ENTOMOLOGY

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**ENTO1023 Insects and People (SP)** Appreciation of the insects and their roles in nature and in civilization for students not required to take ENTO 3013. Biological, historical, social economic, cultural, and medical aspects of insects are discussed. Emphasizes appreciation of entomology and employs many visual aids. Lecture 3 hours per week.

**ENTO1031L Field and Laboratory Studies in Entomology (SP)** A systematic survey and identification of insects and other arthropods occurring in woodland, aquatic and agricultural environments with emphasis on identification and observation of insects in their natural settings. Laboratory 2 hours per week. Corequisite: ENTO 1023.

**ENTO3013 Introduction to Entomology (FA)** Fundamentals of structure, function, biology and identification of insects; typical procedures in control of representative species. Insect collection required. Lecture 2 hours, laboratory 2 hours a week. Suggested prerequisites: BIOL 1543 and BIOL 1541L. Corequisite: ENTO 3010L.

**ENTO3010L Introduction to Entomology Laboratory (FA)** Suggested prerequisite: BIOL 1541L and BIOL 1543. Corequisite: ENTO 3013.

**ENTO400V Special Problems (1-4) (FA, SP, SU)**

**ENTO4013 Insect Behavior and Chemical Ecology (SP, Even years)** Basic concepts in insect senses and patterns of behavioral responses to various environmental stimuli. Previous knowledge of basic entomology is helpful, but not required. Lecture 2 hours, laboratory/discussion 2 hours per week. Corequisite: ENTO 4010L.

**ENTO4010L Insect Behavior and Chemical Ecology Laboratory (SP, Even years)** Corequisite: ENTO 4013.

**ENTO4024 Insect Diversity and Taxonomy (FA)** Principles and practices of insect classification and identification with emphasis on adult insects. Corequisite: ENTO 4020L.

**ENTO4020L Insect Diversity and Taxonomy Laboratory (FA)** Corequisite: ENTO 4024.



**ENTO4033 Immature Insects** (SP, Even years) Identification of immature forms of insects and their phylogenetic relationships. Lecture 1 hour per week. Laboratory 2- two hour sessions per week. Corequisite: ENTO 4030L. Prerequisite: ENTO 4024.

**ENTO4030L Immature Insects Laboratory** (SP, Even years) Identification of immature forms of insects and their Phylogenetic relationships. Corequisite: ENTO 4033.

**ENTO4043 Apiculture** (SP, Odd years) (Formerly ENTO 3113) Review of social behavior of insects and its exemplification in Honeybees. Previous knowledge of basic entomology is helpful but not required. Lecture 2 hours, laboratory 2 hours per week. Corequisite: ENTO 4040L.

**ENTO4040L Apiculture Lab** (SP, Odd years) Corequisite: ENTO 4043.

**ENTO4053 Insect Ecology** (FA, Even years) To develop 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. Corequisite: ENTO 4050L.

**ENTO4050L Insect Ecology Laboratory** (FA, Even years) Corequisite: ENTO 4053.

**ENTO4093 Issues in Pest Management** (SP) Lecture and discussion on local, regional, national and international issues related to pest management policy, ethics, environment, society and science (not for graduate credit). (Same as CSES 4093, PLPA 4093) Prerequisite: must have completed 60 hours of coursework.

**ENTO4123 Insect Pest Management I** (SP, Odd years) Study of principles and concept of insect pest management. Areas covered include 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: ENTO 3013.

**ENTO4120L Insect Pest Management I Laboratory** (FA, Odd years) Corequisite: ENTO 4123.

**ENTO4133 Advanced Applied Entomology** (FA, Even years) A study of the most important pests of humans and their belongings. The course topics include pest identification, biology, survey and sampling methods, computer models, economic injury levels and economic thresholds. Lecture 2 hours/week and laboratory 2 hours/week. Corequisite: ENTO 4130L. Prerequisite: ENTO 3013.

**ENTO4130L Advanced Applied Entomology Laboratory** (FA, Even years) Corequisite: ENTO 4133.

**ENTO462V Internship (3-6)** (IR) Supervised practical work experience in pest management to develop and demonstrate professional competence. A maximum of 6 hours credit per semester or summer session is permitted. Faculty approval of projects proposal prior to enrollment, and written or oral reports are required.

**ENTO500V Special Problems (1-4)** (FA, SP, SU) May be repeated for 4 hours. Prerequisite: graduate standing.

**ENTO5013 Morphology of Insects** (FA, Odd years) 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: ENTO 5010L.

**ENTO5010L Morphology of Insects Laboratory** (FA, Odd years) Corequisite: ENTO 5013.

**ENTO511V Special Topics (1-4)** (IR) Topics not covered in other courses or a more intensive study of specific topics in entomology. May be repeated. Prerequisite: graduate standing.

**ENTO5123 Biological Control** (FA, Even years) 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: ENTO 5120L.

**ENTO5120L Biological Control Laboratory** (FA, Even years) Corequisite: ENTO 5123.

**ENTO5133 Applied Molecular Genetics** (SP, Even years) A hands on course in applied molecular genetic techniques used in agricultural research including molecular diagnostics and population genetics. Students will learn how to apply advanced molecular genetic methodologies and Internet database resources to the organism that they are using for their graduate research. Prerequisite: ANSC 3123.

**ENTO600V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**ENTO6071 Seminar** (FA, SP) 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. May be repeated for 6 hours.

**ENTO6113 Insect Physiology** (SP, Even years) 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: ENTO 6110L.

**ENTO6110L Insect Physiology Laboratory** (SP, Even years) Corequisite: ENTO 6113.

**ENTO6213 Insect Toxicology** (SP, Odd years) Toxicology of chemicals to insects and humans including techniques of testing collecting data, and factors that influence reactions to different classes of insecticides. Previous knowledge of organic physiological chemistry is helpful, but not required. Lecture 2 hours, laboratory 2 hours per week. Corequisite: ENTO 6210L.

**ENTO6210L Insect Toxicology Laboratory** (SP, Odd years) Corequisite: ENTO 6213.

**ENTO700V Doctoral Dissertation (1-8)** (FA, SP, SU) Prerequisite: graduate standing.

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## (ENVD) ENVIRONMENTAL DESIGN

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**ENVD1301 Orientation in the Design Studio Experience** (SU) Four-day intensive design studio experience designed to acquaint prospective design majors with the nature of studio education. Design project and jury, lectures. For the general student.

**ENVD4853 Urban Planning and Practice** (IR) Introduction to the theory and practice of contemporary urban planning; emphasis upon the understanding and applications of urban planning as an interdisciplinary and interactive process necessary to the preparation of comprehensive land use plans and plan implementation; study through readings, development cases, and simulation of urban change dynamics and impact of decision making. Credit cannot be received for both CVEG 4853 and ENVD 4853.

**ENVD4863 Public Design and Planning Determinants** (IR) Introduction to land use theory and application of public and private development devices used in management of change within community; explanation of tools and techniques of land use control such as zoning, subdivision regulations, capital improvement programming, transportation, and citizen participation.

**ENVD4883 Design and Human Behavior** (IR) An advanced-level course investigating behavioral, social, and cultural factors and their implications for the design and planning of the physical environment; relationship of basic behavioral and social concepts to theory of environmental design through seminar and case study.

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## (ETEC) EDUCATIONAL TECHNOLOGY

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**ETEC2002L Educational Technology Lab** (FA, SP, SU) Computer lab exercises and projects appropriate to Educational Technology. Student enrolling in ETEC 2002L must also enroll in ETEC 2001. Corequisite: ETEC 2001

**ETEC2001 Educational Technology** (FA, SP, SU) A criterion-based course designed to provide beginning technology users with conceptual knowledge and skills in the area of fundamental computer technology and traditional educational media. Grades are determined by total points earned on successful completion of identified course projects, unit quizzes, and a proficiency final examination. Corequisite: ETEC 2002L

**ETEC5062 Teaching and Learning with Computer-based Technologies** (SU) Provides students admitted to the Master of Arts in Teaching (M.A.T.) program with the information and experience needed to use computer-based teaching technologies to meet instructional objectives in content area classrooms. Prerequisite: ETEC 2003.

**ETEC5103 Instructional Systems Analysis and Design** (IR) A basic level instructional analysis and design course. Students demonstrate knowledge of specific behavioral, social, and cognitive learning strategies that significantly influence the analysis, design, and evaluation of instructional technology products. Prerequisite: graduate standing.

**ETEC5203 History & Systems of Instructional Technology** (FA, SP, SU) 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.

**ETEC5213 Introduction to Educational Media** (FA, SP, SU) Instruction in selecting, utilizing and evaluating instructional materials and equipment. Prerequisite: graduate standing.

**ETEC5233 Teaching Educational Technology** (FA) Provides practical experience in teaching educational courses. Prerequisite: graduate standing.

**ETEC5243 Instructional Design Theory & Models** (FA) A study of the instructional development process as it pertains to the design and production of instructional materials that use modern technologies. Goal analysis, objectives, evaluation, instructional strategy development, production of an educational product, and revision of the instructional materials are considered. Prerequisite: graduate standing.

**ETEC5253 Information Technologies in Education** (IR) An intensive examination of the role of telecommunications and distance education technologies and their implications for educational practice. Emphasis is on telecommunications, and distance education technologies in classroom environments.

**ETEC5263 Grant Writing in Instructional Technology** (FA, SP, SU) 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.

**ETEC5273 Advanced Design of Educational Media** (FA, SU) Instruction in the planning and local production of instructional materials. Prerequisite: ETEC 5213.

**ETEC528V Field Experiences in Educational Technology (3-6)** (IR) Field experience in educational technology settings. Prerequisite: graduate standing and 6 hours of graduate work in educational technology.

**ETEC5293 Critical Evaluation of Educational Films** (SU) A critical analysis of selected educational films with emphasis on the selection and evaluation process. Appropriate for media specialists, curriculum supervisors, librarians, administrators, classroom teachers and others involved in the purchasing, selection and/or utilization of educational films. Prerequisite: ETEC 5213 or equivalent.

**ETEC5313 Principles of Visual Literacy** (FA, SP, SU) Provides participants with a sense of how visual images can be employed in the teaching process. The use of black and white photography, darkroom techniques, and color slide photography are vehicles for studying the use of visual images in education.

**ETEC5323 Computers as an Instructional Technology** (SP) An advanced course in the creation and evaluation of computer courseware for educational purposes. Emphasis is given to instructional design principles as they relate to computer education.

**ETEC5343 Assessment & Evaluation in Instructional Technology** (FA, SP, SU) Provides learners with a comprehensive survey of the major assessment and evaluation techniques used in the system design and evaluation. Techniques range from needs assessment through summative evaluation.

**ETEC5353 Production of CD ROM Media** (IR) This course illustrates the processes involved in the creation and production of multi-media CD-ROM project. It provides students with the experience of collaboratively designing, developing, and producing a large scale multimedia CD-ROM project. Emphasis is placed on teamwork, quality of instructional materials produced, and the utilization of various technologies. May be repeated for 3 hours. Prerequisite: ETEC 5273.

**ETEC5363 Distance Learning** (IR) This course covers important aspects of the distance learning, course design and teaching. The course will link theory to practice by investigating theory and examining research that undergirds practice, examining and analyzing current practice, proposing practice standards, and discussing issues related to learners in distance duction environments. May be repeated for 3 hours.

**ETEC5373 Introduction to Web Design** (IR) This course covers the important aspects of the web design process as carried out in many educational environments.



The course will include theory to undergird practice, examination and analysis of current practice, proposal of practice standards, and discussion of issues related to learners in this new medium. May be repeated for 3 hours.

**ETEC560V Workshop (1-3) (IR)** This course is designed to enhance the established educational technology curriculum by providing students with special topic content and classroom experiences under the guidance of a faculty member. May be repeated. Prerequisite: graduate standing.

**ETEC574V Internship (1-6) (FA, SP, SU)** 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. May be repeated for 6 hours. Prerequisite: graduate standing.

**ETEC599V Seminar (3-6) (IR)** This course is designed to enhance the established educational technology curriculum by providing students with special topic content and classroom experiences under the guidance of a faculty member. May be repeated for 6 hours. Prerequisite: graduate standing.

**ETEC600V Master's Thesis (1-6) (FA, SP, SU)**

**ETEC605V Special Problems in Educational Technology (1-6) (FA, SP, SU)** Individually designed and conducted studies of educational technology under the guidance of a faculty member. Negotiated learning contract with supervising faculty required before enrollment. On-campus supervision required. May be repeated for 6 hours. Prerequisite: graduate standing.

**ETEC6223 Strategic Planning and IDT Programs (FA, SP, SU)** The course offers readings and experiences intended to develop strategic planning knowledge, values, attitudes, and skills in future instructional design and technology leaders. Topics covered include strategic planning and leadership.

**ETEC6253 Information Technologies in Education (IR)** An intensive examination of the role of telecommunications and distance education technologies and their implications for educational practices. Emphasis is on techniques of development, utilization and evaluation of telecommunication and distance education technologies in classroom environments. Prerequisite: ETEC 5213.

**ETEC6393 Issues and Trends in Instructional Design and Technology (IR)** 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. Prerequisite: ETEC 5213.

**ETEC699V Seminar (1-3) (IR)** The seminar is designed to provide advanced graduate students with an opportunity to explore topics related to instructional design in educational and training environments. Prerequisite: graduate standing.

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## (EUST) EUROPEAN STUDIES

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**EUST399VH Honors Thesis (1-6) (FA, SP, SU)** May be repeated for six hours. May be repeated for 6 hours. Prerequisite: junior standing.

**EUST4003 European Studies Colloquium (SP)** An interdepartmental colloquium with an annual change in subject of investigation, required of students in the European studies program. May be repeated for 6 hours. Prerequisite: sophomore standing.

**EUST4003H Honors European Studies Colloquium (SP)**

**EUST470V Special Topics (1-6) (IR)** An examination of pertinent issues in Europe. May be repeated.

**EUST470VH Honors Special Topics (1-6) (IR)** An examination of pertinent issues in Europe. May be repeated.

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## (EXED) EXTENSION EDUCATION

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**EXED3023 An Introduction to the Cooperative Extension Service (SP)** Development of the Extension Service as a part of the Land-Grant College system; organization, personnel and functions of the Extension Service in agriculture and human environmental sciences. Prerequisite: junior standing.

**EXED4173 Principles of Extension Teaching (FA)** An understanding of the principles of teaching and learning, selection, and use of teaching methods and materials with emphasis on the role of extension as a part of the community

education system. Prerequisite: EXED 3023 and PSYC 2003.

**EXED4183 Management of Volunteer Programs (SP)** Recruiting, training, management, evaluation, and recognition of volunteers in agricultural-related agencies, non-profit organizations, community groups, and advisory committees. Prerequisite: junior standing.

**EXED475V Internship in Extension (3-6) (FA, SP, SU)** A supervised practical work experience in Cooperative Extension that is designed to give the student an insight into the role of Extension employees and an opportunity to gain professional competence in this area. May be repeated for 6 hours. Prerequisite: junior standing and EXED 3023.

**EXED5113 Program Development and Evaluation (IR)** Principles and proceedings of program development process including planning, designing, implementing, and evaluating of extension education programs. An emphasis on the framework for applying adult and non-formal education principles to the change process. Prerequisite: EXED 3023.

**EXED5133 Extension Organization and Administration (IR)** Program and personnel administration for planning and management of county extension programs. Emphasis will be given to organization, structures, principles, and theories of administration, personnel management, training and evaluation. Prerequisite: graduate standing.

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## (FDSC) FOOD SCIENCE

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**FDSC1011 Food Science Orientation (FA)** Introduces food science as a unique program offering exciting career opportunities. This course emphasizes the importance of science in processing and preservation of food and discusses current topics and issues. Provides sound basic information on food constituents, additives, labeling, environmental issues, food regulations, and food safety. Lecture 2 hours per week for 8 weeks.

**FDSC1103 Introduction to Food Science (SP)** This course is designed to provide students with a general application and understanding of current issues associated with food products and food ingredients. Discussions will focus on controversial subjects involving food products, food additives, food safety and preservation techniques based on scientific principles and popular belief. Lecture/discussions/demonstrations, 3 hours per week.

**FDSC2503 Food Safety and Sanitation (FA, Even years)** Principles of sanitation, cleaners and sanitizers, sanitary equipment and plant design, and microbial growth and control in food processing operations. Lecture/discussion/demonstrations, 3 hours per week.

**FDSC3103 Principles of Food Processing (FA, Even years)** The course is designed as an overview of the unit, food processing operations common to all types of food processing plants. Examples will be drawn from international food processing operations processing, fruits and vegetable poultry and meats, oil seeds and cereal grains. Emphasis on oral communication and critical thinking skills. Corequisite: FDSC 3100L. Prerequisite: CHEM 1123 and CHEM 1121L.

**FDSC3100L Principles of Food Processing Laboratory (FA)** Corequisite: FDSC 3103.

**FDSC3202 Introduction to Food Law (SP, Even years)** Discussion of government laws and regulations affecting the manufacture of food. Emphasis is on federal regulations relating to food safety, labeling, and the FDA. Discussion relates to practical use of food law. Lecture 2 hours per week.

**FDSC400V Special Problems (1-4) (FA, SP, SU)** Investigation of assigned problems in food science. Prerequisite: junior standing.

**FDSC4011 Undergraduate Seminar (SP)** Open to all food science majors. Prerequisite: upperclass standing.

**FDSC4114 Food Analysis (SP, Even years)** Methods of analysis, instrumentation, and laboratory techniques for measuring the chemical composition of raw and value-added products. Lecture 3 hours, laboratory 2 hours per week. Corequisite: FDSC 4110L. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L.

**FDSC4110L Food Analysis Laboratory (SP, Even years)** Laboratory exercises providing students with experience of analytical techniques and instrumentation used in food analysis. Laboratory exercises in Food Analysis. Laboratory 2 hours per week. Corequisite: FDSC 4114. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L.

**FDSC4124 Food Microbiology (SP)** Microbiology, contamination, preservation, and spoilage of different kinds of

foods, food poisoning, sanitation, control, and inspection; microbiology of water; and standard methods for official food and public health laboratories. Lecture 2 hours, laboratory 4 hours per week. (Same as MBO 4124) Corequisite: FDSC 4120L. Prerequisite: MBO 2013 and MBO 2011L and CHEM 1123 and CHEM 1121L.

**FDSC4120L Food Microbiology Laboratory (SP)** Corequisite: FDSC 4124.

**FDSC4203 Quality Evaluation and Control (SP, Odd years)** Definition of grades and standards of quality by chemical, physical, and sensory techniques. Lecture 2 hours, laboratory 2 hours per week. Corequisite: FDSC 4200L. Prerequisite: CHEM 1123 and CHEM 1121L.

**FDSC4200L Quality Evaluation and Control Laboratory (SP, Odd years)** Corequisite: FDSC 4203.

**FDSC4223 Risk Analysis for Biological Systems (FA, Odd years)** Principles of risk assessment including exposure assessment and dose response, and risk management. Methods of risk analysis modeling and simulation with computer software. Applications of risk analysis in animal, food, and environmental systems. (Same as POSC 4223) Prerequisite: STAT 2023 (or STAT 2303 or AGST 4023) and BENG 1022.

**FDSC4304 Food Chemistry (FA)** 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. Corequisite: FDSC 4300L. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L.

**FDSC4300L Food Chemistry Laboratory (FA)** Laboratory experiments have been designed to complement material covered in FDSC 4304. Demonstrates principles of chemical changes in food during processing. Provides opportunities for developing critical thinking and problem solving skills. Laboratory 3 hours per week. Corequisite: FDSC 4304. Prerequisite: CHEM 1123 and CHEM 1121L and CHEM 2613 and CHEM 2611L.

**FDSC431V Internship in Food Science (1-4) (IR)** A supervised practical work experience in the food industry or a governmental or industrial organization having direct impact on the food science area to gain professional competence and insight into employment opportunities. Prerequisite: junior standing.

**FDSC4413 Sensory Evaluation of Food (FA, Odd years)** 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. Corequisite: FDSC 4410L. Prerequisite: PSYC 2013 or STAT 2013 or ISYS 2013 or AGST 4023 or STAT 2023.

**FDSC4410L Sensory Evaluation of Food Laboratory (FA, Odd years)** The laboratory is designed to develop critical thinking and problem solving skills through participation in specific sensory tests; analyzing, interpreting, and reporting data; designing and conducting individual sensory evaluation projects. Laboratory 2 hours per week. Corequisite: FDSC 4413.

**FDSC4713 Food Product and Process Development (FA, Odd years)** Multidisciplinary approaches for developing new food products and processes; in the context of an industry-sponsored project. Group dynamics and interpersonal skills. Factors that influence product and process development. Analysis and modeling applied to food process design. Lecture 2 hours and laboratory 3 hours per week. Corequisite: FDSC 4710L. Prerequisite: FDSC 3103 and FDSC 4203 or FDSC 4304.

**FDSC4710L Food Product and Process Development Laboratory (FA, Odd years)** Multidisciplinary approaches for developing new food products and processes in context of an industry-sponsored project. Group dynamics and interpersonal skills. Factors that influence product and process development. Analysis and modeling applied to food process design. Lecture 2 hours and laboratory 3 hours per week. Corequisite: FDSC 4713.

**FDSC472V Special Topics in Food Science (1-4) (IR)** Discussion focused on selected topics of particular fields of raw product physiology, food processing, chemistry, physiology, microbiology, evaluation, sensory analysis, and preservation.

**FDSC4754 Engineering Principles of Food Processing (SP, Odd years)** 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.

Corequisite: FDSC 4750L. Prerequisite: MATH 1213, PHYS 2033, and PHYS 2031L.

**FDSC4750L Engineering Principles of Food Processing Laboratory** (SP, Odd years)

**FDSC5001 Seminar** (FA, SP) Presentation and discussion of graduate student research. Prerequisite: graduate standing.

**FDSC509V Special Problems Research (1-4)** (FA, SP, SU) Original investigation on assigned problems in food science. Prerequisite: graduate standing.

**FDSC5603 Enology** (SP, Even years) Examination of factors influencing wine grape quality with emphasis on wine and grape regions, grape composition, and fermentation. Lecture/discussion 3 hours per week. Prerequisite: CHEM 3813.

**FDSC5703 Fermented Foods** (FA, Odd years) Examination of factors influencing the fermentation of food and beverage, and methods to control the microbiological stability and quality of these products. Lecture/discussion 3 hours per week. Prerequisite: CHEM 3813 and FDSC 4124.

**FDSC600V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**FDSC602V Special Topics (1-3)** (IR) Discussions focused on selected topics of particular fields of raw product physiology and food processing, chemistry, physiology, microbiology, evaluation, sensory analysis and preservation. May be repeated. Prerequisite: graduate standing.

**FDSC6033 Food Biochemistry** (SP, Even years) 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.

**FDSC6101 Colloquium in Food Science** (FA, SP) Presentation and discussion of papers and topics by doctoral students and graduate faculty in the interdepartmental food science program. Prerequisite: graduate standing.

**FDSC6123 Food Carbohydrate Chemistry** (SP, Odd years) 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.

**FDSC6503 Chemistry of Cereal and Oilseed Products** (IR) Structure and function of proteins and carbohydrates in food products derived from cereals and oilseeds with emphasis on rice and soybeans. Lecture 3 hours per week. Prerequisite: CHEM 3813.

**FDSC700V Doctoral Dissertation (1-6)** (FA, SP, SU) 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.

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**(FIIR) FULBRIGHT INSTITUTE  
OF INTERNATIONAL RELATIONS**

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**FIIR2813 Introduction to International Relations** (FA, SP) Introduction to the international system, theories of international behavior, political economy, conflict and peacemaking, the third world, international law and organizations, and the nature of the post-Cold War world.

**FIIR4003 International Relations Seminar** (FA) The capstone course in international relations involves intensive study of major global trends and issues. Students choose a research project culminating in a senior thesis to meet the College writing requirement. Prerequisite: FIIR 2813 or PLSC 2813.

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**(FINN) FINANCE**

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**FINN3003 Personal Financial Management** (FA, SP) Topics covered include budgeting, financial planning, managing credit, taxes, insurance, investments, and retirement planning.

**FINN3033 Money and Banking** (FA, SP, SU) Financial history; financial institutions; theory of practice and income; monetary policy in theory and practice. Prerequisite: ECON 2013 and ECON 2023 and ACCT 2013.

**FINN3043 Principles of Finance** (FA, SP, SU) Introduction to financial markets and institutions, investments, and financial management. Addresses the role and function of financial intermediaries and markets for fixed income and equity securities; understand how interest rates are

determined and financial assets are priced; learn how firms create value through its investment and financing decisions. Prerequisite: ECON 2013 and ECON 2023 and ACCT 2023 and ISYS 2013.

**FINN3053 Financial Markets and Institutions** (FA, SP, SU) Role and operations of financial markets and institutions in the economy. Supply of, demand for, funds, interest rates and flow of funds analysis. Financial policies, practices of bank and nonbank financial institutions. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**FINN3063 Principles of Investments** (FA, SP, SU) Introduction to basic investment principles including: risk return tradeoff, types of securities, market efficiency, interest rates, and speculative investments. Prerequisite: FINN 3043.

**FINN3102 Financial Modeling** (FA, SP, SU) Develop strong computer skills in financial analysis by integrating conceptual material with spreadsheet-based numerical solution and simulation techniques. Prerequisite: FINN 3043.

**FINN3133 Commercial Banking** (FA, SP, SU) Commercial bank administration, management; loans; bond portfolios; credit analysis; public relations; analysis and interpretations of Federal Reserve regulations and publications. Prerequisite: FINN 3043.

**FINN3603 Intermediate Financial Management** (FA, SP, SU) Develop analytical competencies in financial planning, cost of capital estimation, application of discounted cash flow approach to valuation and capital allocation, lease analysis, evaluation of merger and organizational restructuring strategies. Prerequisite: FINN 3043.

**FINN3623 Risk Management** (FA, SP) A survey of the extent and types of risk in business; ways of dealing with business risk; use of security and commodity exchanges; survey of insurance for risk bearing purposes.

**FINN3703 International Finance** (FA, SP, SU) Introduction to international financial markets, exchange rates and exchange rate determination, balance of trade measures, and vehicles for foreign trade financing.

**FINN3933 Real Estate Principles** (FA, SP, SU) Comprehensive, covering economics of real estate, real estate value, real estate finance, rights in real property and their transfer, public programs, policies relating to real property.

**FINN4003H Finance Honors Colloquium** (IR) Explores important concepts, significant events and/or new developments in the field of Finance. Prerequisite: Senior standing.

**FINN4013 Seminar in Personal Financial Planning** (SP) Explores financial planning function, including contact, data acquisition, plan development and implementation; covers all areas of personal financial planning including investments, insurance, taxes, and estate planning; addresses planning techniques and financial planning ethical issues; emphasis on case studies. Pre- or Corequisite: FINN 4733. Prerequisite: FINN 3003, FINN 3063, FINN 3623, and ACCT 3843.

**FINN410V Special Topics in Finance (1-6)** (IR) Explore current events, new developments and special topics in Finance not covered in other courses. May be repeated for 6 hours. May be repeated for 6 hours. Prerequisite: FINN 3043.

**FINN4133 Advanced Investments** (FA, SP) 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. Prerequisite: FINN 3063.

**FINN4143 Portfolio Management I** (FA) Theories of portfolio construction, rules, fundamental analysis, and random walk as applied to portfolio management; investment goals and strategies; decision making on portfolio of Rebsamen Investment Trust. Prerequisite: ACCT 3723 and FINN 3063 and by invitation only.

**FINN4153 Portfolio Management II** (SP) Theories of portfolio construction, rules, fundamental analysis, and random walk as applied to portfolio management; investment goals and strategies; decision making on portfolio of Rebsamen Investment Trust. Prerequisite: FINN 4143 and by invitation only.

**FINN4163 Fixed Income Securities I** (FA) The markets and institutional settings of fixed income securities; valuation, and risk analysis of money market and capital market instruments; strategies and management of bond portfolios; taxable and tax-exempt securities; U.S. and non-U.S. fixed income securities; term structure of interest rate; interest rate derivatives as hedging tools. Prerequisite: FINN 3043 and FINN 3063.

**FINN4173 Fixed Income Securities II** (SP)

Continuation of FINN 4163. The markets and institutional settings of fixed income securities; valuation, and risk analysis of money market and capital market instruments; strategies and management of bond portfolios; taxable and tax-exempt securities; U.S. and non-U.S. fixed income securities; term structure of interest rate; interest rate derivatives as hedging tools. Prerequisite: FINN 4163.

**FINN4233 Financial Policy and Planning** (FA, SP, SU) Policy and problems in financial planning for working capital, capital budgets, and capital structure. Prerequisite: ACCT 3723 and FINN 3603.

**FINN4313 Advanced Commercial Bank Management** (FA, SP) Problems and cases emphasizing application of analytical tools, techniques in decision making process. Determination of operating policies regarding loans, investments, liquidity, capital; efficient performance of lending, investment function; profit planning, analysis; strategies of growth, competition; evaluation of bank performance. Prerequisite: FINN 3133.

**FINN4413 Real Estate Investment and Appraisal** (FA) Investment analysis and valuation theory applied to real estate. Prerequisite: FINN 3933.

**FINN4433 Real Estate Finance** (SP) Consideration of professional aspects of real estate, brokerage, property management, finance, appraisal, property development, current problems and developments relating to real property. Prerequisite: FINN 3933.

**FINN450V Independent Study (1-3)** (FA, SP, SU) Permits students on an individual basis to explore selected topics in finance, with the consent of instructor.

**FINN4733 Life and Health Insurance I** (FA) Basic principles, functions, uses of life and health insurance; types of policy contracts; calculation of premiums, reserves; organizations, management, supervision, of companies.

**FINN4833 Property and Casualty Insurance I** (SP) Forms and functions of fire, marine, inland marine, automobile title, miscellaneous types insurance and bonds for business, personal use.

**FINN4843 Property and Casualty Insurance II** (SP) Institutional and functional aspects of property and casualty insurance industry; analyzes types of carriers, marketing organizations, underwriting, rates and rate making, financial analysis, problems facing the industry in these areas. Prerequisite: FINN 3623.

**FINN5203 Money and Capital Management** (SP, SU) Role of finance in U.S. economy; the institutions, monetary theory, policies that comprise environment in which financial decisions are made. Finance function within firm; financial analysis, planning and control, financial decision making models, financial policies for management. Prerequisite: ACCT 5103 and ECON 5103 and ISYS 5203.

**FINN5303 Advanced Financial Management** (FA, SP, SU) Financial management of firm, with special emphasis on financial planning, capital budgeting, cost-of-capital concepts. Prerequisite: FINN 5203.

**FINN5333 Investment Theory and Management** (FA) 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 5203.

**FINN5623 Investment Banking and Securities Markets** (FA) Topics include investment banking, securities markets, traditional and new financial products, money management, and financial innovation. Prerequisite: FINN 5203.

**FINN5633 Financial Institutions** (SP) Savings intermediation and its effects on allocating investments funds; characteristics of financial institutions including services, assets management, growth; relations between growth of institutions and interest rates, consumer behavior, investment demand, government policies, critical evaluation of performance by financial intermediaries. Prerequisite: FINN 5203.

**FINN5703 Multinational Business Finance** (FA) Problems pertinent to manager of firm in multinational business environment, including international institutions, risks, investments, capital budgeting. Prerequisite: FINN 5203.

**FINN6043 Finance Theory** (FA, SP, SU) Provides a conceptual understanding of key theoretical developments in the field of financial economics, including firm decisions under risk within a world of uncertainty.

**FINN6133 Seminar in Investment Theory** (SP) Study advanced literature in field investments, with special reference to theory of random walks, stock valuation models, portfolio management.

**FINN6233 Seminar in Financial Management** (FA)



Financial management of firm with emphasis on financial theory or firm, quantitative methods used in financial analysis, planning.

**FINN636V Special Problems in Finance (1-6) (IR)**  
Case studies in investments, corporation finance, money and banking, monetary theory, international finance, public finance. By arrangement.

**FINN6733 Seminar in Financial Markets and Institutions (FA, SP, SU)** 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.

**FINN700V Doctoral Dissertation (1-18) (FA, SP)**  
Prerequisite: candidacy.

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## (FLAN) FOREIGN LANGUAGE

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**FLAN3002 Health and Life Sciences Terminology (IR)** A systematic introduction to the Greek and Latin components of terminology used in the health and life sciences. Recommended for majors in zoology, chemistry, biology, botany, pre-med, pre-dent, pre-vet, pre-nursing, and other health-related fields.

**FLAN302V Translation Workshop (1-3) (IR)** Introduction to translation as a literary form, dealing with the problems involved in interpreting a text and recreating it in English.

**FLAN3173 Introduction to Linguistics (IR)**  
Introduction to language study with stress upon modern linguistic theory and analysis. Data drawn from various languages reveal linguistic universals as well as phonological, syntactic, and semantic systems of individual languages. Related topics: language history, dialectology, language and its relation to culture and society, the history of linguistic scholarship. Prerequisite: junior standing.

**FLAN3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in foreign languages).

**FLAN398V Special Studies (1-3) (IR)** A course (not independent study) that covers a topic or author not usually presented in depth in regular courses. May be repeated.

**FLAN4003 Special Language I (FA)** Under the number, various oriental, African, or other less commonly-taught languages will be offered from year to year. Prerequisite: junior standing.

**FLAN4013 Special Languages II (SP)** Continuation of Special Language I. Prerequisite: FLAN 4003 or equivalent.

**FLAN423V Culture and Civilization: Field Studies (1-6) (IR)** May be taken by students participating in overseas workstudy programs approved by the department.

**FLAN5023 Language Teaching and the Internet (FA)** This course provides graduate students of foreign languages with innovative ways to teach and communicate through the use of the Internet as applied to second language learning. Topics of discussion include Instructional Systems Design, Web-Based Technologies, Graphics, Presentation Technologies, and Effective Utilization of Technological Tools in Language Courses.

**FLAN5033 Language Teaching and Video Applications (IR)** 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, Video Taping, Editing and Development for Internet and DVD delivery, and Effective Utilization of Video in teaching and communication.

**FLAN504V Translation Workshop (1-6) (IR)**  
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.

**FLAN505V Workshop (1-3) (IR)** Specialized professional problems and topics in foreign language based career areas. May be repeated for 3 hours.

**FLAN5063 Teaching Foreign Languages on the College Level (IR)** Focus on basic methodological concepts and their practical application to college foreign language instruction.

**FLAN5083 Developments in Second Language Teaching (IR)** A review of techniques, strategies, and methodologies and a survey of recent developments in second language teaching.

**FLAN575V Special Investigations (1-6) (FA, SP)**  
May be repeated for 6 hours.

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## (FREN) FRENCH

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**FREN1003 Elementary French I (FA, SP)**

**FREN1016 Intensive Elementary French (FA, SP, SU)** Equivalent to 1003 and 1013. Stresses aural comprehension and practical speaking ability. Reading, writing, and grammar in support of communication skills.

**FREN1013 Elementary French II (FA, SP)**  
Elementary courses stress correct pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: FREN 1003 or equivalent.

**FREN2003 Intermediate French I (FA, SP)**  
Intermediate courses lead to greater facility in spoken language and to more advanced reading skills. Prerequisite: FREN 1013 or equivalent.

**FREN2016 Intensive Intermediate French (FA, SP, SU)** Equivalent to FREN 2003 and 2013. Stresses aural comprehension and practical speaking ability. Reading, writing, and grammar in support of communication skills. Prerequisite: FREN 1013 or equivalent.

**FREN2013 Intermediate French II (FA, SP)**  
Continued development of basic speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: FREN 2003 or equivalent.

**FREN2013H Honors Intermediate French II (FA, SP)**

**FREN3003 Advanced French (FA, SP, SU)** Further intensive practice for the purpose of strengthening written and oral expression. Includes a review of the essentials of French grammar. Prerequisite: FREN 2013 or equivalent.

**FREN3033 French Conversation (FA)** Three hours per week of guided conversation practice for the post-intermediate student. Prerequisite: FREN 2013.

**FREN3063 Ph.D. Reading Requirement I (SU)**

**FREN3103 Cultural Readings (FA, SP, SU)** A course designed to build vocabulary and to strengthen reading skills and oral expression through extensive practice with culturally authentic materials. Prerequisite: FREN 2013.

**FREN3113 Introduction to Literature (FA, SP, SU)**  
Further development of reading skills and introduction to literary commentary and analysis. Prerequisite: FREN 3003 or FREN 3103.

**FREN399VH Honors French Course (1-6) (FA, SP)**  
May be repeated for 12 hours. Prerequisite: junior standing.

**FREN4003 French Grammar and Composition (FA)** Prerequisite: FREN 3003 or FREN 3103.

**FREN4033 French for Oral Proficiency (SP)** Three hours per week of conversation practice for the advanced undergraduate. Prerequisite: FREN 3003 or FREN 3103.

**FREN4063 Applied Linguistics: Phonology, Morphology, and Syntax (FA)** Prerequisite: FREN 3003 and FREN 3103.

**FREN4113 Special Themes in French Literature (IR)** Topics not normally covered in period courses. Sample topics: "The Comic Tradition in French Literature," "French Cinema." Topics announced one semester in advance. Prerequisite: FREN 3113.

**FREN4203 Quebec Studies (IR)** A study of Quebec's culture, institutions, economy, literature and cinema. Prerequisite: FREN 3113.

**FREN4203H Honors Quebec Studies (IR)** A study of Quebec's culture, institutions, economy, literature and cinema. Prerequisite: FREN 3113.

**FREN4213 French Civilization (SP)** Prerequisite: FREN 3113.

**FREN4223 A Survey of French Literature I (FA, SP, SU)** A survey of French literature, its forms and themes from the medieval period through the 18th century. Prerequisite: FREN 3113.

**FREN4233 A Survey of French Literature II (FA, SP, SU)** A survey of French literature, its forms and themes in the 19th and 20th centuries. Prerequisite: FREN 3113.

**FREN4333 Business French (FA)** Introduction and orientation to the French world of business and commerce through the study of vocabulary, forms, and formulas and expression used in commercial correspondence. Prerequisite: FREN 3113.

**FREN4343 Business French: Quebec (SP)**

Introduction to French Business Language in the context of North America, focusing on Quebec and its economy. May be repeated for 6 hours. Prerequisite: FREN 3113

**FREN475V Special Investigations (1-6) (FA, SP)**  
May be repeated.

**FREN5003 French Grammar and Phonetics (IR)**  
Systematic review of principles of French grammar and syntax; Comprehensive presentation of French phonetics.

**FREN5013 French Stylistics and Advanced Composition (IR)** Analysis of genres and stylistic choices available in written French. Intensive practice in composition especially as it relates to graduate-level courses.

**FREN5033 Advanced French Conversation (IR)**  
This course will provide 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.

**FREN5213 French Culture & Civilization (IR)** An analysis of French cultural symbols and attitudes as observed in their historical, economical, political, social, educational, and linguistic aspects.

**FREN5233 Advanced Business French (IR)** The purpose of this course is to provide insight into both the language and the culture of the French-speaking business world, primarily in metropolitan France. The course is primarily an advanced language course focused on a specialized and technical vocabulary and subject matter, drawn from the world of business.

**FREN5333 Old French Literature (IR)** An intensive study of French Medieval Literature from the Chansons de Geste to Vilon, including an in-depth analysis of the genres and their evolution, and of the major authors of the times.

**FREN5433 French 16th Century Literature (IR)** A survey of representative writers of the sixteenth century.

**FREN5533 French 17th Century Theatre (IR)**

**FREN5543 French 17th Century Literature (IR)** A survey of representative writers of the seventeenth century.

**FREN5673 French 18th Century Literature (IR)**

**FREN5703 Special Topics (IR)** May be offered in a subject not specifically covered by the courses otherwise listed. May be repeated for 6 hours.

**FREN5723 The Development of French Romanticism (IR)**

**FREN575V Special Investigations (1-6) (IR)** May be repeated.

**FREN5783 The French Nineteenth Century Novel (IR)**

**FREN5813 French 20th Century Theatre (IR)**

**FREN5823 French 20th Century Literature (IR)** A survey of representative writers of the twentieth century.

**FREN5833 French 20th Century Novel (IR)**

**FREN600V Master's Thesis (1-6) (IR)**

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## (GEOG) GEOGRAPHY/ GEOSCIENCES

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**GEOG1123 Human Geography (FA, SP, SU)** Basic course in human geography stressing the interrelationships between the natural factors of the environment and man's activities, especially the role of geography in the understanding of social problems and economic and political activities.

**GEOG2023 Economic Geography (IR)** Systematic study of the geographical distribution of man's activities and the Earth's products as related to geographic factors. Prerequisite: sophomore standing.

**GEOG2103 Emerging Nations (FA, SP)** Survey of problems, development potential, and physical and human resources of the developing worlds. Areas covered include Latin America, Africa, Middle East, and Monsoon Asia.

**GEOG2103H Honors Emerging Nations (FA, SP)** Survey of problems, development potential, and physical and human resources of the developing worlds. Areas covered include Latin America, Africa, Middle East, and Monsoon Asia.

**GEOG2203 Developed Nations (FA, SP)** Survey of the human and physical resources and the problems of the developed world. Areas covered included Europe, Anglo-America, USSR, Japan, and Australia.

**GEOG3003 Conservation of Natural Resources (FA, SP, SU)** Theory and growth of conservation and the wise use of the major natural resources of the United States.



This course meets the requirement in conservation for teachers. Prerequisite: junior standing.

**GEOG3023 Introduction to Cartography (FA)**

Students learn basic principles of map design, cartographic theory and field surveying to produce a variety of computer-generated maps. An introductory course designed for students in a variety of different disciplines using AutoCad software and various new technologies. Field trips may be required.

**GEOG3333 Oceanography (SP)** The sea, its landforms; its winds and currents as related to the atmosphere, world climates, and world trade; its basin as avenues for continental drift; its waters as habitat for plant and animal life; its marine and submarine resources as presently and potentially useful to man. Offered as physical science. Prerequisite: junior standing.

**GEOG3343 Natural Regions of North America (SP, Odd years)** Introduces students to the characteristics of the natural environments of North America. The soils, landforms, climate, hydrology, and flora and fauna of the principal natural regions of the United States, Canada, and Central America are examined.

**GEOG3353 Economic Geography of NAFTA (IR)** Systematic study of the geographical distribution of economic activities in the countries of the North American Free Trade Agreement. Prerequisite: junior standing.

**GEOG3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in geography).

**GEOG399VH Honors Course (1-6) (IR)** May be repeated for 12 hours. Prerequisite: junior standing.

**GEOG4013 Latin America (IR)** Geography of South America, Mexico, Central America, and the Caribbean Islands.

**GEOG4033 Geography of the Middle East (IR)** Physical and cultural landscapes, natural and cultural resources, art and architecture, landuse, 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. Prerequisite: junior standing.

**GEOG4063 Urban Geography (SP)** 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. Prerequisite: junior standing.

**GEOG4093 Geography of Arkansas (FA)** Natural resources of the state, its leading occupations, and its geographic regions. Prerequisite: junior standing.

**GEOG410V Special Problems in Geography (1-6) (FA, SP, SU)** Designed to meet the needs of students who wish to study one particular geographic topic in some detail. May be repeated for 6 hours. Prerequisite: junior standing.

**GEOG4173 The Latin American City (IR)** 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.

**GEOG4243 Political Geography (FA, Odd years)** 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. Prerequisite: junior standing.

**GEOG430V Internship in Physical Geography (3-6) (FA, SP, SU)** Supervised experience in municipal, county, state or private natural resource management agency, or any other such organization approved by instructor.

**GEOG4353 Elements of Weather (FA)** Examination of the atmospheric processes that result in multifarious weather systems. Offered as physical science. Prerequisite: junior standing.

**GEOG4363 Climatology (SP)** Fundamentals of topical climatology followed by a study of regional climatology. Offered as physical science. Prerequisite: GEOG 1003 and/or GEOG 4353.

**GEOG4384 Principles of Landscape Evolution (FA)** Examines the role of waves, rivers, wind, and tectonics in shaping and modifying the surface of the earth. Considers the way in which an understanding of landscape processes is essential to the effective solution of environmental problems. Lecture 3 hours, laboratory 2 hours per week.

**GEOG4383 Hazard & Disaster Assessment, Mitigation, Risk & Policy (SP)** 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. May be repeated for 3 hours. Prerequisite: junior standing or above.

**GEOG440V Internship in GIS & Cartography (3-6) (FA, SP, SU)** Supervised experience in GIS and/or cartographic applications with municipal, county, state, or private enterprises. May be repeated for 6 hours.

**GEOG4523 Computer Mapping (SP)** 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 AutoCad and FreeHand software to build a map portfolio. Field trips may be required. Prerequisite: GEOG 3023.

**GEOG4543 Geographic Information Systems (FA)** Computer assisted analysis and display of geographic resource data. Course develops the theory behind spatial data analysis techniques, and reinforces the theory with exercises that demonstrate its practical applications. (Same as ANTH 4543)

**GEOG4553 Introduction to Raster GIS (FA)** 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. (Same as ANTH 4553) Prerequisite: GEOG 4543 or ANTH 4543.

**GEOG4563 Vector GIS (FA, SP, SU)** 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 Arc-node based software and relational data bases. (Same as ANTH 4563) Prerequisite: GEOG 3023 or GEOG 4543.

**GEOG4573 Introduction to GRASS Applications in GIS (IR)** An introduction to geographic information systems (GIS) problem solving using the Geographic Resource Analysis Support System (GRASS) software. (Same as ANTH 4573)

**GEOG4593 Introduction to Global Positioning Systems (FA, SP, SU)** Introduction to navigation, georeferencing, and digital data collection using GPS receivers, data loggers, and laser technology for natural science and resource management. Components of NavStar Global Positioning system are used in integration of digital information into various GIS platforms with emphasis on practical applications. (Same as ANTH 4593)

**GEOG4653 Advanced Raster GIS (SP, Odd years)** Advanced raster topics are examined beginning with a theoretical and methodological review of Tomlin's cartographic modeling principles. Topics vary and include Fourier methods, image processing, kriging, spatial statistics, principal components, fuzzy and regression modeling, and multi-criteria decision models. Several raster GIS programs are examined with links to statistical analysis software. Prerequisite: GEOG 4553 or ANTH 4553.

**GEOG4723 Australia and the Pacific Islands (IR)** Natural setting, resources, and human use of these areas and the significance of their world position. Prerequisite: junior standing.

**GEOG4753 Geography of the United States and Canada (IR)** The geographic regions of Anglo-America. Prerequisite: junior standing.

**GEOG4783 Geography of Europe (IR)** Geographic regions of the area with emphasis on their present development. Prerequisite: junior standing.

**GEOG4793 Geographic Concepts for Global Studies (SU)** Application of geographic concepts and perspectives for analyzing global relationships. Developing and developed nations as well as geographic themes of current importance will be examined. Prerequisite: junior standing.

**GEOG4863 Quantitative Techniques in Geography (FA, SP, SU)** An introduction to the application of standard quantitative and spatial statistical techniques to geographical analysis. Students will use both micro and large system computers in the course. (Same as ANTH 4863) Prerequisite: (STAT 4003 and STAT 4001L) or equivalent.

**GEOG5003 Seminar in Geography (IR)** Selected topics, the nature of which varies with the need. Prerequisite: graduate standing.

**GEOG5011 Colloquium (SP)** Weekly meetings of faculty, graduates, advanced students and guests to discuss research and trends in the field of geography. May be repeated for 2 hours.

**GEOG5053 Quaternary Environments (FA)** 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. (Same as ANTH 5053, GEOL 5053) Prerequisite: graduate standing.

**GEOG5093 History of Geography (SP, Even years)** Chronological development of the science; leaders in the field of geography; and the evolution of the major concepts of geography. Prerequisite: graduate standing.

**GEOG510V Special Problems in Physical Geography (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**GEOG5113 Global Change (FA)** 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.

**GEOG520V Special Problems in Human Geography (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**GEOG530V Special Problems in Regional Geography (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**GEOG5333 Research Methods and Materials in Geography (FA, Odd years)** Geographical research and the preparation of research papers. Prerequisite: graduate standing.

**GEOG600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

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## (GEOL) GEOLOGY/ GEOSCIENCES

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**GEOL1113 General Geology (FA, SP, SU)** Survey of geological processes and products, and their relationships to landforms, natural resources, living environments and human beings. Lecture 3 hours per week. GEOL 1111L is recommended as a corequisite.

**GEOL1113H Honors General Geology (IR)** Survey of geological processes and products and their relationships to landforms, natural resources, living environments, and human beings. Lecture 3 hours, laboratory 2 hours per week. Corequisites: GEOL 1111 M.

**GEOL1111L General Geology Laboratory (FA, SP, SU)** Laboratory exercises concerning the identification of rocks and minerals, use of aerial photographs and topographic maps, and several field trips. Pre- or Corequisite: GEOL 1113.

**GEOL1111M Honors General Geology Laboratory (FA)** Survey of geological processes and products and their relationships to landforms, natural resources, living environments, and human beings. Lecture 3 hours, laboratory 2 hours per week. Corequisite: GEOL 1113 H.

**GEOL1133 Environmental Geology (SP)** The application geologic principles and knowledge of problems created by human occupancy and exploitation of the physical environment. Prerequisite: (GEOL 1113 and GEOL 1111L) or (GEOG 1003 and GEOG 1001L).

**GEOL1131L Environmental Geology Laboratory (SP)** Laboratory exercises concerning human interactions with the physical environment including the study of earthquakes, volcanoes, flooding, erosion, mass wasting, water supply and contamination, and waste disposal. Prerequisite: (GEOL 1113 and GEOL 1111L) or (GEOG 1003 and GEOG 1001L).

**GEOL1131M Honors General Geology II Laboratory (SP)** Laboratory exercises concerning study of organisms commonly found as fossils, sedimentary rocks, correlations, and earth history.

**GEOL2313 Mineralogy (FA)** General principles and hand sample study of common minerals. Prerequisite: GEOL 1113.

**GEOL2310L Mineralogy Laboratory (FA)** Corequisite: GEOL 2313.

**GEOL3002 Geology for Engineers (FA)** Geologic principles involved in construction, reservoir location, etc. Lecture 2 hours, laboratory 2 hours per week. Corequisite: GEOL 3000L.

**GEOL3000L Geology for Engineers Laboratory (FA)** Corequisite: GEOL 3002.

**GEOL3114 Invertebrate Paleontology (SP)** Survey of the invertebrate phyla commonly preserved as fossils

emphasizing their physical and biological characteristics. Lecture 3 hours, laboratory 2 hours per week. Corequisite: GEOL 3110L. Prerequisite: GEOL 1133 or (BIOL 1543 and BIOL 1541L) or equivalent.

**GEOL3110L Invertebrate Paleontology Laboratory (SP)** Corequisite: GEOL 3114.

**GEOL3313 Igneous and Metamorphic Rocks (SP)** Megascopic study and classification of igneous and metamorphic rocks. Lecture 2 hours, laboratory 2 hours per week. Corequisite: GEOL 3310L. Prerequisite: GEOL 2313.

**GEOL3310L Igneous and Metamorphic Rocks Laboratory (SP)** Corequisite: GEOL 3313.

**GEOL3413 Sedimentary Rocks (FA)** An introductory study of sedimentary rocks from the standpoint of classification, field and laboratory description, and genesis. Lecture 2 hours, laboratory 2 hours per week. Corequisite: GEOL 3410L. Prerequisite: GEOL 2313.

**GEOL3410L Sedimentary Rocks Laboratory (FA)** Corequisite: GEOL 3413.

**GEOL3513 Structural Geology (FA)** Survey of deformational features and their geological significance in the crust of the earth. Lecture 3 hours per week. Corequisite: GEOL 3511L. Prerequisite: GEOL 1004 or GEOL 1113 or GEOL 3002.

**GEOL3511L Structural Geology Laboratory (FA)** Corequisite: GEOL 3513.

**GEOL360V Undergraduate Special Problems (1-3) (FA, SP, SU)** Library, laboratory, or field research in different phases of geology.

**GEOL3901 Junior Honors Course (FA, SP, SU)** Special honors research in geology. One hour credit each semester. Prerequisite: junior standing.

**GEOL3911 Junior Honors Course (FA, SP, SU)** Special honors research in geology. One hour credit each semester. Prerequisite: junior standing.

**GEOL3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in geology).

**GEOL4033 Hydrogeology (SP)** Occurrence, movement, and interaction of water with geologic and cultural features. Lecture 3 hours per week. Corequisite: GEOL 4030L. Prerequisite: MATH 2564 and GEOL 3513 and GEOL 3511L.

**GEOL4030L Hydrogeology Laboratory (SP)** Exercises and field trips illustrating principles of water movement through porous media and the methods by which this movement is monitored. Corequisite: GEOL 4033.

**GEOL4043 Water Resource Issues (FA)** Human impact on the quantity and quality of water resources including impact of agriculture, industrial, and municipal uses, and a comparative policies and water resource development, past and present.

**GEOL4053 Geomorphology (SP)** Mechanics of landform development. Lecture 2 hours, laboratory 3 hours per week. Several local field trips are required during the semester. Corequisite: GEOL 4050L. Prerequisite: GEOL 1004 and GEOL 1113 and GEOL 3002.

**GEOL4050L Geomorphology Laboratory (SP)** Corequisite: GEOL 4053.

**GEOL4153 Karst Hydrogeology (IR)** 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. Prerequisite: GEOL 4033.

**GEOL4223 Stratigraphy and Sedimentation (SP)** 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. Corequisite: GEOL 4220L. Prerequisite: GEOL 3413.

**GEOL4220L Stratigraphy and Sedimentation Laboratory (SP)** Corequisite: GEOL 4223.

**GEOL4253 Petroleum Geology (FA)** Distribution and origin of petroleum. Lecture 2 hours, laboratory 2 hours per week. Corequisite: GEOL 4250L. Prerequisite: geology major and senior standing.

**GEOL4250L Petroleum Geology Laboratory (FA)** Corequisite: GEOL 4253.

**GEOL436V Geology Field Trip (1-2) (SP)** Camping field trip to areas of geologic interest, usually conducted during Spring Break. May be repeated for 4 hours. Prerequisite: GEOL 3313.

**GEOL4413 Principles of Remote Sensing (FA)** Theoretical and practical consideration of radar imagery, aerial photography, and infrared imagery for understanding Earth resource problems related to agriculture, archeology, engineering, forestry, geography, and geology. Lecture 2 hours, laboratory 2 hours per week. (Same as GEOS 4413) Corequisite: GEOL 4410L. Prerequisite: GEOL 1004 and GEOL 1113 or GEOL 3002.

**GEOL4410L Principles of Remote Sensing Laboratory (FA)** (Same as GEOS 4410L) Corequisite: GEOL 4413.

**GEOL4433 Geophysics (IR)** 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. Corequisite: GEOL 4430L. Prerequisite: MATH 2564 and PHYS 2033 and PHYS 2031L and GEOL 3513 and GEOL 3511L.

**GEOL4430L Geophysics Laboratory (IR)** Corequisite: GEOL 4443.

**GEOL4643 Historical Geology (FA)** Physical and biological events that form the history of the earth from its formation to the beginning of the historical era. Graduate enrollment only with departmental permission. Corequisite: GEOL 4641L.

**GEOL4641L Historical Geology Laboratory (SP)** Laboratory exercises concerning the study of physical and biological features of earth history; includes two field trips. Graduate enrollment only with departmental permission. Corequisite: GEOL 4643.

**GEOL4666 Geology Field Camp (SU)** A professional course taught off campus emphasizing occurrence, description, mapping, and interpretation of major rock types. Prerequisite: GEOL 3413 and GEOL 3513 and GEOL 3511L. (may not be taken for graduate credit).

**GEOL481V Cooperative Education Program (1-6) (FA, SP, SU)** Credit for off-campus, compensated work experience related to geology arranged through the Cooperative Education Office and Department of Geology. May be repeated.

**GEOL4922 Senior Honors Course (FA, SP, SU)** Special honors research in geology. Two hours of credit each semester. Prerequisite: junior honors.

**GEOL4932 Senior Honors Course (FA, SP, SU)** Special honors research in geology. Two hours of credit each semester. Prerequisite: junior honors.

**GEOL5001 Graduate Seminar (IR)** Informal discussions of research as reported in geological literature. All graduate students are expected to attend.

**GEOL5053 Quaternary Environments (FA)** 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. (Same as ANTH 5053, GEOG 5053) Prerequisite: graduate standing.

**GEOL5063 Geochemistry (FA)** Chemistry of geologic processes and the geochemical cycles of selected elements. Prerequisite: CHEM 1103 and CHEM 1101L and CHEM 1123 and CHEM 1121L.

**GEOL5076 Advanced Field Methods of Applied Hydrogeology (SU)** Applied field course emphasizing collection and interpretation of ground water data. Three hours may be applied toward an M.S. degree in geology. Prerequisite: GEOL 4033.

**GEOL5123 Stratigraphic Principles and Practice (IR)** Physical and biological characteristics of sedimentary environments and their correlation in time with emphasis on the local geologic section. Corequisite: GEOL 5120L. Prerequisite: GEOL 4223.

**GEOL5120L Stratigraphic Principles and Practice Laboratory (IR)** Corequisite: GEOL 5123.

**GEOL5132 Ammonoid Biostratigraphy (IR)** Laboratory study of the biology, taxonomy and biostratigraphy of Paleozoic ammonoid cephalopods. Pre- or Corequisite: GEOL 5123.

**GEOL5142 Conodont Biostratigraphy (IR)** Laboratory study of the biology, taxonomy, and biostratigraphy of the conodonts. Pre- or Corequisite: GEOL 5123.

**GEOL5153 Environmental Site Assessment (IR)** Principles, problems, and methods related to conducting an environmental site assessment. An applied course covering field site assessment, regulatory documentation, and report preparation. Prerequisite: GEOL 4033.

**GEOL5163 Hydrogeologic Modeling (IR)** 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: GEOL 4033 and computer literacy.

**GEOL5223 Sedimentary Petrology (FA)** Sediments and sedimentary rocks. Lecture 2 hours, laboratory 2 hours per week. Corequisite: GEOL 5220L. Prerequisite: GEOL 4223.

**GEOL5220L Sedimentary Petrology Laboratory (FA)** Corequisite: GEOL 5223.

**GEOL5263 Hydrochemical Methods (SP)** Collection, analytical and interpretation techniques and methods for water, including quality control and quality assurance. Prerequisite: CHEM 1123 and CHEM 1121L.

**GEOL5423 Remote Sensing of Natural Resources (SP, Odd years)** Advanced course in remote sensing technology with special emphasis on interpretive techniques for resource management and research. Prerequisite: GEOL 4413.

**GEOL5444 Advanced Petroleum Geology (SP, Even years)** Advanced well logging techniques, quantitative analysis, and subsurface correlation. Lecture 3 hours, laboratory 2 hours per week. Corequisite: GEOL 5440L. Prerequisite: GEOL 4253.

**GEOL5440L Advanced Petroleum Geology Laboratory (SP, Even years)** Corequisite: GEOL 5444.

**GEOL5533 Marine Geology (FA)** Geological principles as applied to the study of the world's ocean basins. Course includes basic theories of ocean basin evolution, continental margin evolution, coastal geologic processes, and methods of study of deep sea records of global change and paleoceanography. Corequisite: GEOL 5530L.

**GEOL5530L Marine Geology Laboratory (FA)** Corequisite: GEOL 5533.

**GEOL5543 Tectonics (FA)** Development of ramifications of the plate tectonics theory. Analysis of the evolution of mountain belts. Lecture 3 hours per week. Prerequisite: GEOL 3513 and GEOL 3511L.

**GEOL560V Graduate Special Problems (2-6) (FA, SP, SU)** Library, laboratory, or field research in different phases of geology. May be repeated for 4 hours.

**GEOL600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

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## (GEOS) GEOSCIENCES

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**GEOS1113 General Geology (FA, SP, SU)** Survey of geological processes and products, and their relationships to landforms, natural resources, living environments and human beings. Lecture 3 hours per week. GEOS 1111L is recommended as a corequisite.

**GEOS1111L General Geology Laboratory (FA, SP, SU)** Laboratory exercises concerning the identification of rocks and minerals, use of aerial photographs and topographic maps, and several field trips. Pre- or Corequisite: GEOS 1113.

**GEOS1133 Environmental Geology (SP)** The application of geologic principles and knowledge of problems created by human occupancy and exploitation of the physical environment. Prerequisite: GEOL 1113 and GEOL 1111L or GEOG 1003 and GEOG 1001L.

**GEOS1131L Environmental Geology Lab (FA, SP, SU)** Laboratory exercise concerning human interactions with the physical environment including the study of earthquakes, volcanoes, flooding, erosion, mass wasting, water supply and contamination, and waste disposal. Prerequisite: GEOL 1113 and GEOL 1111L or GEOG 1003 and GEOG 1001L.

**GEOS4413 Principles of Remote Sensing (FA)** Theoretical and practical consideration of radar imagery, aerial photography, and infrared imagery for understanding Earth resource problems related to agriculture, archeology, engineering, forestry, geography, and geology. Corequisite: GEOS 4410L. Prerequisite: GEOL 1004 and GEOL 1113 or GEOL 3002.

**GEOS4410L Principles of Remote Sensing Laboratory (FA)** Corequisite: GEOS 4413.

**GEOS4563 Geology of Our National Parks (FA)** 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. Prerequisite: GEOL 1113.

**GEOS4563H Honors Geology of Our National**



**Parks (FA)** 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. Prerequisite: GEOL 1113.

**GEOS4560L Geology of Our National Parks Laboratory (FA)**

**GEOS4633 Near Surface Propection (SP)** Geophysical remote sensing methods are investigated for detecting and mapping subsurface features up to 5m in depth. Magnetometry, resistivity, conductivity, ground-penetrating radar, and other methods are examined with a particular focus on their use for understanding archeological deposits. Requires use of instruments, computer skills, and field trips. (Same as ANTH 4633) Prerequisite: ANTH 4553 or GEOG 4553 or ANTH 4573 or GEOG 4573 or GEOG 4543 and GEOL 1113 and ANTH 3023.

**GEOS4693 Environmental Justice (SP)** 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.

**GEOS4693H Honors Environmental Justice (SP)** 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.

**GEOS4690L Environmental Justice Laboratory (SP)**

**GEOS4733 GPS Geodesy in Geoscience (SP, Even years)** Applications of GPS geodesy in geosciences are presented with emphasis on case studies of on-going research projects such as seismic and volcanic hazard. Statistical procedures and factors affecting data quality will be discussed. Analysis will focus on archived data, on-line data from GPS research networks, and data collected by students. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: GEOL 1113.

**GEOS4730L GPS Geodesy in Geoscience Laboratory (SP, Even years)**

**GEOS5053 Quarternary Environments (FA)** 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. (Same as ANTH 5053, ENDS 5053, GEOG 5053). Prerequisite: graduate standing.

**GEOS5853 Stable Isotope Geology (SP)** 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. May be repeated for 3 hours. Prerequisite: GEOL 5063 or GEOL 5263.

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## (GERM) GERMAN

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**GERM1003 Elementary German I (FA, SP)**

**GERM1013 Elementary German II (FA, SP)** Elementary courses stress correct pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: GERM 1003 or equivalent.

**GERM2003 Intermediate German I (FA, SP)** Intermediate courses lead to greater facility in spoken language and to more advanced reading skills. Prerequisite: GERM 1013 or equivalent.

**GERM2013 Intermediate German II (FA, SP)** Continued development of basic speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: GERM 2003 or equivalent.

**GERM2013H Honors Intermediate German II (FA, SP)**

**GERM3003 Advanced German I (FA)** Development of reading, writing, listening, and speaking skills. Some grammar review and translation exercises. Emphasis on vocabulary acquisition and the correct use of idiomatic expressions. Prerequisite: GERM 2013.

**GERM3013 Introduction to Literature (FA)** Development of reading skills and introduction to literary analysis. Prerequisite: GERM 2013 or equivalent.

**GERM3033 Conversation (SP)** Three hours per week of guided conversation practice for the post-intermediate student. Prerequisite: GERM 2013.

**GERM3063 Ph.D. Reading Requirement (SU)**

**GERM399VH German Honors Course (1-6) (FA, SP)** May be repeated for 12 hours. Prerequisite: junior standing.

**GERM4003 Advanced German II (SP)** Further development of reading, writing, listening, and speaking skills. Some grammar review and translation exercises. Emphasis on vocabulary acquisition and the correct use of idiomatic expressions. Prerequisite: GERM 2013.

**GERM4033 Conversation (SP)** Three hours per week of conversation practice for the advanced undergraduate. Prerequisite: GERM 2013.

**GERM4123 The German Novelle (IR)** An intensive study of the novelle as a genre from its origin to the present. Prerequisite: GERM 3013.

**GERM4133 The German Drama (IR)** A study of the development of the forms and themes of the German drama from the middle ages to the present. Prerequisite: GERM 3013.

**GERM4143 German Lyric Poetry (IR)** A study of the forms and themes of German lyric poetry from the middle ages to the present. Prerequisite: GERM 3013.

**GERM4213 German Civilization (IR)** Prerequisite: GERM 2013 or equivalent.

**GERM4223 German-Speaking Countries in the 20th Century (FA, SP, SU)** Continues the introduction to German culture and civilization begun with GERM 4213 with emphasis on the emergence in the 20th century contemporary Austria, Switzerland, and a unified Germany.

**GERM4333 Business German I (FA)** Introduces students to the language of business German and provides insights into business practices in the German-speaking countries. Covers aspects of business geography, the European Union, transportation/shipping, business correspondence, resume writing and job application. Open to all majors; no business prerequisites. May be repeated for 6 hours. Prerequisite: GERM 2013.

**GERM4343 Business German II (SP)** Introduces students to the language of business German and provides insights into business practices in the German-speaking countries. Covers aspects of business geography, environmental issues, merchandizing, trade, forms of payment, taxation, benefits, import/export, and business correspondence. Open to all majors; no business prerequisites. May be repeated for 6 hours. Prerequisite: GERM 2013 and GERM 4333.

**GERM470V Special Topics (1-3) (IR)** May be offered in a topic not specifically covered by courses otherwise listed. May be repeated for 6 hours.

**GERM475V Special Investigations (1-6) (FA, SP)** May be repeated.

**GERM5223 Early German Literature: Middle Ages to the Enlightenment (FA, SP, SU)**

**GERM5273 German Literature: Enlightenment, Storm and Stress, and Classicism (FA, SP, SU)**

**GERM5323 German Literature: Romanticism and Realism (FA, SP, SU)**

**GERM5343 Early Modern German Literature: Late 19th and Early 20th Century (FA, SP, SU)**

**GERM5363 German Literature after 1945 (FA, SP, SU)**

**GERM5703 Special Topics (FA, SP, SU)** May be offered in a subject not specifically covered by the courses otherwise listed. May be repeated for 6 hours.

**GERM575V Special Investigations (1-6) (FA, SP, SU)** May be repeated.

**GERM600V Master's Thesis (1-6) (FA, SP, SU)**

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## (GNEG) GENERAL ENGINEERING

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**GNEG1122 Introduction CAD (FA, SP)** General course in the use of engineering drawings for communications and design. Proper use of computer for computer-aided drafting and design; 2-dimensional, 3-dimensional, and solid modeling; use of manual drafting equipment; geometrical exercises; orthographic projections; auxiliary view; sketching;

dimensioning. Pre- or Corequisite: MATH 1213 or higher. Corequisite: GNEG 1120L.

**GNEG1120L Introduction to CAD Laboratory (FA, SP)** Corequisite: GNEG 1122.

**GNEG2801 Cooperative Education I (FA, SP, SU)** A student in the work period of the Cooperative Education program must register for a Cooperative Education course. A written report is required. Department heads determine the level of the course of which a student registers.

**GNEG2811 Cooperative Education II (FA, SP, SU)**

**GNEG3801 Cooperative Education III (FA, SP, SU)**

**GNEG3811 Cooperative Education IV (FA, SP, SU)**

**GNEG4801 Cooperative Education V (FA, SP, SU)**

**GNEG4811 Cooperative Education VI (FA, SP, SU)**

**GNEG5003 Topics in Engineering for Teachers (SU)**

An introduction to engineering and technology concepts, as well as methods to conduct engineering and technology instruction. Intended for secondary school teachers during a summer workshop.

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## (GREK) GREEK

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**GREK1003 Elementary Greek I (FA)** The rudiments of classical Greek, with concentration on grammar, vocabulary, and syntax. Short selections from ancient authors lead to basic reading ability.

**GREK1013 Elementary Greek II (SP)** A continuation of the rudiments of classical Greek, with concentration on grammar, vocabulary, and syntax. Short selection from ancient authors lead to basic reading ability. Prerequisite: GREK 1003 or equivalent.

**GREK1203 Beginning Modern Greek I (IR)** Conversational language of Greece today. Stresses correct pronunciation, aural comprehension, and simple speaking ability. Leads to active mastery of basic grammar and limited reading ability.

**GREK1213 Beginning Modern Greek II (IR)** A continuation of GREK 1203. Stresses correct pronunciation, aural comprehension, and simple speaking ability. Leads to active mastery of basic grammar and limited reading ability.

**GREK2003 Plato's Apology of Socrates or Greek New Testament or Both (FA)**

**GREK2013 Homer (SP)** Selections from the Iliad or the Odyssey: a survey of Greek epic poetry. Prerequisite: GREK 2003 or equivalent.

**GREK4023 Greek Poetry or Plato (IR)** Selections from the Elegiac, Iambic, and Lyric poets. Plato's Apology and Crito. Prerequisite: GREK 2013 or equivalent.

**GREK4033 Herodotus or Thucydides (IR)** Readings of Herodotus, Book VII, and Thucydides, Book VI; collateral readings on the Persian and Peloponnesian Wars. Prerequisite: GREK 2013 or equivalent.

**GREK4043 Greek Drama (IR)** Readings of 2 tragedies and one comedy; a study of the Greek theatre. Prerequisite: GREK 2013 or equivalent.

**GREK475V Special Investigations (1-6) (FA, SP, SU)** May be repeated.

**GREK575V Special Investigations (1-6) (IR)** May be repeated for 12 hours.

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## (HESC) HUMAN ENVIRONMENTAL SCIENCES

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**HESC1013 Introduction to Clothing Concepts (FA, SP)** Origin of dress, the evolution of fashion as an economic power, the sociological and psychological aspects of clothing in various cultures, aesthetics of dress, selection and consumption of clothing. Lecture 3 hours per week. Pre- or corequisite: HESC 1501 (for HESC majors only).

**HESC1023 Introduction to Apparel Production (FA, SP)** Course focuses on basic principles of apparel production and analysis of garment components of mass produced apparel. Students utilize computer generated designs in the production process. Laboratory 5 hours per week.

**HESC1034 Design I Studio (FA)** (Formerly HESC 1035) Introduction to the application of design elements and principles to 2-D and 3-D design. Studio 8 hours per week. Pre- or corequisite: HESC 1501 (applies to HESC majors only). Corequisite: HESC 1031.



**HESC1031 Design I: Design Principles and Elements (FA)**

Introduction to design principles and elements as they relate to 2-D and 3-D design. Lecture meets one hour per week. Corequisite: HESC 1034.

**HESC1044 Design II Studio: Drawing and Drafting (SP)**

(Formerly HESC 1045) Introduction to the application of drawing and drafting. Studio meets eight hours per week. Pre- or corequisite: HESC 1501 (applies to HESC majors only). Corequisite: HESC 1041. Prerequisite: HESC 1031 and HESC 1034.

**HESC1041 Design II Lecture (SP)**

Design drawing and drafting. Corequisite: HESC 1044. Prerequisite: HESC 1031 and HESC 1034.

**HESC1053 Computer Based Methods for Apparel (FA)**

This course is designed to give students basic experience with CAD (computer aided design) software.

**HESC1201 Introduction to Dietetics and Nutrition (FA)**

Introduction to profession of dietetics and nutrition including history, scope and future of professionals with emphasis on academic preparation, internships, acquisition of professional credentials, career ladder and career opportunities. Guest speakers will supplement lectures and assignments.

**HESC1213 Nutrition in Health (FA, SP)**

The functions of food, body processes, optimum diets in relation to health and physical fitness.

**HESC1403 Life Span Development (FA, SP)**

A broad overview of the physical, psychological, and social development of the individual from conception until death. Emphasis is on individual development in a family context. Lecture 3 hours per week.

**HESC1501 Orientation to Human Environmental Sciences (FA, SP)**

Adjustment to study and personal problems in college. History of human environmental sciences and breadth of its professional opportunities.

**HESC1603 Introduction to Hospitality Management (FA)**

Overview of the hospitality industry with an emphasis on the history, scope, economic trends, and professional opportunities of this global industry. Professional areas include: commercial, institutional, and long term residential food service; hotels and resorts; travel and tourism; convention and club management.

**HESC200V Special Problems (1-3) (FA, SP, SU)**

Special problems are conducted under the guidance of a faculty member and include an inquiry initiated by the student into an aspect of study or program not dealt with in the regular curriculum. Students are required to submit to their instructor a detailed outline of the problem they will examine. May be repeated for 3 hours.

**HESC2013 Quality Assessment of Apparel (SP)**

Study of apparel from the perspective of structure, aesthetics, cost and expected performance of the finished product. Prerequisite: HESC 1023.

**HESC2023 Visual Merchandising (FA)**

Techniques of visual merchandising and illustration as applied to the apparel industry. CAD principles and techniques implemented in the study of fashion figures as well as window and in-store displays. Lecture 1 hour, laboratory 4 hours per week. Prerequisite: ARTS 1003.

**HESC2053 Introduction to Textile Science (FA, SP)**

Textile fibers and fabrics, their structure, properties, manufacture, wearing qualities and methods of laundering, finishing, and dyeing. Artistic and economic selection of materials for clothing and household furnishings. Lecture 2 hours, laboratory 2 hours per week. Corequisite: HESC 2050L.

**HESC2050L Introduction to Textile Science Laboratory (FA, SP)**

Corequisite: HESC 2053.

**HESC2112 Foods I (FA)**

(Formerly HESC 2113) Physical and chemical characteristics of foods and factors that affect these characteristics during storage and preparation. Lecture 2 hours. Pre- or corequisite: HESC 1501 (applies to HESC majors only). Corequisite: HESC 2111L. Prerequisite: CHEM 1074 and CHEM 1071L (or CHEM 1103 and CHEM 1101L).

**HESC2111L Foods I Laboratory (FA)**

(Formerly HESC 2110L) Laboratory exercises and practice applicable of Foods I. Lab 3 hours. Corequisite: HESC 2112. Prerequisite: CHEM 1074 and CHEM 1071L (or CHEM 1103 or CHEM 1101L).

**HESC2123 Catering for Healthy Lifestyles (SP)**

Meal management including planning, preparation, and serving of nutritious meals to families and groups. Lecture 1 hour, laboratory 4 hours per week. Corequisite: HESC 2120L. Prerequisite: HESC 2113.

**HESC2120L Catering for Healthy Lifestyles Laboratory (SP)**

Corequisite: HESC 2123.

**HESC2203 Nutrition for Exercise and Sport (SP)**

The integration of concepts from nutrition and exercise physiology into an applied multidisciplinary study of how food, beverages and dietary supplements influence physical performance. Prerequisite: HESC 1213.

**HESC2402 Infant and Toddler Development (FA)**

(Formerly HESC 2403) Human development from conception through toddlerhood. Physical, emotional, social, and cognitive development are covered. Lecture 2 hours per week. Corequisite: HESC 2401L.

**HESC2401L Infant and Toddler Development Laboratory (FA)**

(Formerly HESC 2400L) Corequisite: HESC 2402.

**HESC2413 Family Relations (FA, SP)** Courtship, marriage, and parenthood in the United States, with attention to cultural and psychological factors that affect relations among family members. Lecture 3 hours per week. Pre- or corequisite: HESC 1501 (applies to HESC majors only).

**HESC2433 Child Development (FA, SP)**

Theory, research, and application in cognitive, social, physical, and linguistic development of the child aged three to adolescence. Lecture 3 hours per week; time arranged for directed observation. Prerequisite: 6 hours of human development and family studies or psychology.

**HESC2443 The Hospitalized Child: Child Life Programming (IR)**

Introduces child life programming in health care settings. Topics include: roles and expectations of a Child Life Specialist, importance of play, coping techniques, family advocacy, administration and professionalism. Lecture 3 hours per week.

**HESC255V Special Topics (1-3) (FA, SP, SU)**

Topics not covered in other courses or a more intensive study of specific topics in the specializations of human environmental sciences. May be repeated.

**HESC2803 Studio I: Development of Interior Space (FA)**

An introduction to interior space articulation and the creation of small scale spaces. Study of human needs, activities, experiences, and spatial requirements. Exploration of design processes and graphic communication for creative design development and solutions. Studio 6 hours per week. Prerequisite: HESC 1041 and HESC 1044.

**HESC2813 Studio II: Interior Design Process and Application (SP)**

Intermediate studio problem activities with emphasis on conceptualization, design theory, ideation, programming, and project documentation. Studio 6 hours per week. Prerequisite: HESC 2803.

**HESC2823 Interior Design Materials and Resources (FA)**

A study of materials and resources used in designing residential and contract interiors. CSI format utilized. Lecture 3 hours per week. Prerequisite: HESC 1044 and HESC 1041L.

**HESC2833 Introductory Presentation Media (FA)**

Techniques of perspective drawing, illustration, and rapid visualization. Components of various presentation methods and formats. Exploration of a variety of media and available commercial products. Studio 6 hours per week. Prerequisite: HESC 1041 and HESC 1044.

**HESC2842 Lighting Systems (SP)**

(Formerly HESC 2843) Exploration of design applications of lighting, design methods, and scientific aspects. Lecture 2 hours per week. Corequisite: HESC 2841. Prerequisite: HESC 2803 and HESC 2833.

**HESC2841 Lighting Studio (SP)**

Application of lighting design principles to interior design problems. Will include drafting and specification writing. Laboratory 2 hours per week. Corequisite: HESC 2842. Prerequisite: HESC 2803 and HESC 2833.

**HESC2883 History of Interior Design I (FA)**

Study of historic interiors and furniture from antiquity through 1800. Emphasis is given to identification of the interiors style and furniture of these eras. Lecture 3 hours.

**HESC2893 Principles of Computer-Aided Design (SP)**

(Formerly HESC 3843) Applying the use of computer aided design to the interior design process. The application of CAD with interior design projects that relate to both interior residential and commercial spaces, dimensioning, and spreadsheets for specifications. For interior design majors or consent by instructor. Laboratory 6 hours per week. Prerequisite: sophomore standing.

**HESC3003 Apparel Production (SP)**

A study of product development and production and the related vocabulary necessary to communicate professionally within the industry. Laboratory 6 hours per week. Prerequisite: HESC 1023 and HESC 1053.

**HESC3013 Introduction to Fashion Merchandising (FA)**

A study of the retailing of fashion. Included are market structures, store philosophies, job descriptions, responsibilities at the management level, structural

operations, work procedures, job performance evaluation, job application, the resume, interdependencies of the retail store with other segments of the fashion industry. Recommended for students seeking a career in business organizations that produce and/or distribute fashion products and services. Lecture 3 hours per week. Prerequisite: HESC 1013 and (AGEC 1103 or ECON 2143).

**HESC3033 Fashion Merchandising Methods (SP)**

Exploration of activities associated with the procurement of fashion apparel. A fashion analysis is directed toward apparel demands and the creation of a fashion statement by the use of specific quantitative skills. Course follows fashion item from the designer to the store. Prerequisite: HESC 3013.

**HESC3204 Nutrition for Health Professionals and Educators (SP)**

Fundamental human nutrition; nutritive value of foods and general functions of nutrients based on concepts derived from inorganic and organic chemistry. Examples relating nutrition to disease used as illustrations to deepen understanding of normal nutrition. Lecture 4 hours per week. Pre- or Corequisite: (CHEM 2613 and CHEM 2611L) or (CHEM 3603 and CHEM 3601L) or (CHEM 3703 and CHEM 3701L).

**HESC3213 Dietetic and Nutrition Practice: Tools and Applications (FA)**

Standards of practice, ethics, application of interviewing and counseling techniques, medical terminology, documentation in medical records, reimbursement and marketing in the fields of dietetics and nutrition. Prerequisite: HESC 1213 and HESC 2113.

**HESC3402 Child Guidance (FA, SP)**

(Formerly HESC 3403) Introduction to the guidance system. Focus on discipline techniques that are positive and age/stage appropriate for children ages 3-8. Lecture 2 hours/week plus 1 hour demonstration. Corequisite: HESC 3401L. Prerequisite: HESC 2433.

**HESC3401L Child Guidance Laboratory (FA, SP)**

(Formerly HESC 3400L) Corequisite: HESC 3402.

**HESC3423 Adolescent Development (SP)**

Physiological and psychological development of the older child and youth, from pre-adolescence to adulthood. Theories of adolescent development. Cross-cultural studies. Peer group influences. Some attention to pathological behaviors. Prerequisite: HESC 1403 or PSYC 2003.

**HESC3443 Families in Crisis (FA)**

An interdisciplinary perspective on internal and external crises faced by contemporary families, including substance abuse, natural disasters and other crisis events. Students will explore the family processes during such experiences and develop strategies for stress management, coping, and recovery. Lecture 3 hours per week.

**HESC3604 Food Preparation for the Hospitality Industry (FA, SP)**

Preparation and service of food for large groups. Recipe standardization, menu planning, cost control, sanitation, safety, and overall quality assurance. Observation of and experience with quantity food production and use of equipment. Lecture 2 hours, laboratory 6 hours per week. Corequisite: HESC 3600L. Prerequisite: HESC 1213 and HESC 2113 and consent.

**HESC3600L Food Preparation for the Hospitality Industry Laboratory (FA, SP)**

Prerequisite: HESC 1213 and HESC 2113.

**HESC3653 Food Systems Management (FA)**

Organization and management of institutional and hospital food service with focus on functions of management, health codes, and professional development. Lecture 3 hours per week. Prerequisite: HESC 1213.

**HESC3763L Family Resource Management Laboratory (FA)**

Explores management concepts and practices in the lives of individuals and families from a systemic perspective. Lecture 2 hours per week. Laboratory 2 hours per week.

**HESC3803 Studio III: Working Drawings and Building Systems (FA)**

Continued study of structures, construction techniques and mechanical systems. Students will execute detail drawings of furniture, cabinetry, and other interior components in addition to large scale drawings. Manual and computer applications will be utilized for projects. Prerequisite: HESC 2813, HESC 2823, HESC 2843, and HESC 3843.

**HESC3813 Studio IV: Interiors for Public Use (FA)**

Advanced studio problems involving larger-scale interior spaces for public use. Students will use computer applications for project production. 6 studio hours per week. Prerequisite: HESC 3803, HESC 3843, and HESC 3823.

**HESC3863 Advanced Presentation Media (FA)**

(Formerly HESC 2863) Advanced class in presentation techniques and methods, including both hand- and technology-based techniques for perspective drawing, rendering and presentation of design concepts and completed

problem solutions. 6 studio hours per week. Prerequisite: HESC 2833 and HESC 2893.

**HESC3883 History of Interior Design II (SP)** Study of historic interiors and furniture from 1800 through the present. Emphasis given to the identification of the interior styles and furniture of these eras. Lecture 3 hours per week.

**HESC400V Special Problems (1-6) (FA, SP, SU)** May be repeated for 2 hours.

**HESC4023 Advanced Apparel Merchandising (FA)** Advanced Apparel Merchandising aspects of fashion through interpretation of apparel classification, seasonal cycles, stock emphasis, assortment strategies, target customers, and apparel trends and an overview of marketing communication including advertising, personal selling and sales promotion. Prerequisite: HESC 3033.

**HESC4033 Advanced Textile Study (FA)** Practical consumer study of fabrics used for apparel and house furnishings including selection, use and care. Lecture 3 hours per week. Prerequisite: HESC 2053 and CHEM 1074 and CHEM 1071L.

**HESC4043 History of Apparel (FA)** The evolution of clothing from ancient times to the twentieth century with emphasis upon Western civilization. Cultural and economic factors affecting dress and customs associated with dress will be stressed. Lecture three hours per week. Prerequisite: ANTH 1023 or SOCI 2013 or HESC 1013.

**HESC4053 Contemporary Apparel (SP)** Fashion as a social force, 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. Lecture three hours per week. Prerequisite: HESC 3033 and HESC 4043.

**HESC4063 Advanced Apparel Production (FA)** An advanced study of product development incorporating technology used in the industry for a career in fashion merchandising and/or product development. Prerequisite: HESC 3003.

**HESC4073 Apparel Studies Internship (SU)** A practical experience in a retail store or in a work situation related to the apparel industry to gain insight into the field of apparel merchandising and operations. May be repeated for 2 hours. Prerequisite: junior standing and 2.50 cum GPA and HESC 3033.

**HESC4103 Experimental Foods (SP)** Application of experimental methods for investigations in cookery. Group and individual problems. Lecture 2 hours, laboratory 3 hours per week. Corequisite: HESC 4100L. Prerequisite: HESC 2113 and CHEM 1123 and CHEM 1121L (or HESC 2113 and CHEM 1074 and CHEM 1071L).

**HESC4100L Experimental Foods Laboratory (SP)** Corequisite: HESC 4103.

**HESC4213 Advanced Nutrition (FA)** Normal nutrition with emphasis on utilization of nutrients. Lecture and reports on current literature 3 hours per week. Pre- or Corequisite: CHEM 3813. Prerequisite: HESC 3204.

**HESC4223 Nutrition During the Life Cycle (FA)** 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. Prerequisite: HESC 1213 and either (ZOOL 2213 and ZOOL 2211L or ANSC 3032 or POSC 3032 and ANSC 3042 or POSC 3042) or (CHEM 1074 and CHEM 1071L and BIOL 1543 and BIOL 1541L).

**HESC4243 Community Nutrition (SP)** Identifying, assessing and developing solutions for nutritional problems encountered at the local, state, federal and international level. Lecture 3 hours per week. Pre- or Corequisite: HESC 3204.

**HESC425V Food and Nutrition Seminar (1-2) (SP)** Upperclassmen, graduate students and members of faculty meet weekly for presentation and discussion of selected topics. Two credits (2 semesters) required of all foods and nutrition graduate students. May be repeated for 2 hours.

**HESC4264 Medical Nutrition Therapy I (FA)** Principles of nutritional care with emphasis on pathophysiology, assessment, and treatment of chronic illnesses. Lecture 3 hours, laboratory 3 hours per week. Pre- or corequisite: CHEM 3813, HESC 4213 and HESC 3213. Corequisite: HESC 4260L. Prerequisite: ZOOL 2213 and ZOOL 2211L (or ANSC or POSC 3042).

**HESC4260L Medical Nutrition Therapy I Laboratory (FA)** Corequisite: HESC 4264.

**HESC4273 Medical Nutrition Therapy II (SP)** Principles of nutritional care with emphasis on pathophysiology, assessment, and treatment in critical illness. Lecture 3 hours per week. Prerequisite: HESC 4264.

**HESC4303 Professional Development in Human Environmental Sciences (FA, SP)** Enhancement of the professional and personal development of students by fostering an understanding of the historical and philosophical basis of Human Environmental Sciences, with an emphasis on the interrelationships and integration of the component specialties. Clarification of career goals and development of professional skills.

**HESC4423 Adult Development (FA)** (Formerly HESC 3433) Examine individual development beginning with the transition adulthood through middle age; approximate age ranges are 18-60 years. Content focuses on physical, cognitive, psychological, and social changes that occur throughout this period of the life span. The impact of love, work, and family on men's and women's movement through the transitions that comprise adulthood are emphasized. Prerequisite: HESC 1403 or PSYC 2003 and junior standing.

**HESC4433 Dynamic Family Interaction (SP)** Examination of family interaction across the lifespan. Methods for enhancing marriage and family relations will be examined. Sources of marital conflict, intergenerational support and negotiations process will be analyzed. Lecture three hours per week. Prerequisite: HESC 2413 and junior standing.

**HESC4443 Gerontology (SP)** Physiological and psychological development of the aging individual, extended family relations, service networks for the elderly, and retirement activities. Some attention to housing and care needs of persons in advanced years. Lecture 3 hours per week. Seminar. Prerequisite: HESC 1403 (or HESC 2413 or PSYC 2003 or SCWK 2133) and junior standing.

**HESC4453 Parenting and Family Dynamics (FA)** Focus is on influence of parenting and family dynamics on individual development, especially factors in family life that contribute to normal psychological development. Topics include family values, the psychology of sex and pregnancy, the transition to parenthood, childbearing techniques, family influences on cognitive and social development, and changes in family relationships during the life cycle. Prerequisite: HESC 1403 or PSYC 2003.

**HESC4463 Administration and Evaluation of Child Development Programs (SP)** Information on planning, developing, operating, and evaluating child development programs. Topics include physical facilities, staff, curriculum, budgets, parent involvement, and education. Lecture and discussion 3 hours per week. Prerequisite: HESC 3403 and junior standing.

**HESC4472 Child Development Practicum (SP)** (Formerly HESC 4474) Interaction with parents and planning, implementing, and evaluating directed experiences with children ages 3-5 in an NAEYC accredited laboratory setting—U. of A. Nursery School. 2 hours lecture per week. Corequisite: HESC 4472L.

**HESC4472L Child Development Practicum Laboratory (SP)** (Formerly HESC 4470L) Actual experience facilitating children's learning with classroom activities. Participation in planning, implementing, and evaluating individual children and program. 6 hours laboratory per week. Corequisite: HESC 4472.

**HESC4483 Internship in Human Development and Family Studies (SU)** The internship experience provides practical experience for students in settings that are designed to serve the needs of individuals and/or families across the life span. Students must work a minimum of 60 hours per credit hour in the setting. Must be taken no sooner than the summer following completion of junior year. May be taken for an additional 3 hours of elective credit if second experience is distinctly different from first internship. May be repeated for 3 hours. Prerequisite: HESC 4303.

**HESC4493 Public Policy Advocacy for Children and Families (FA)** Public policy advocacy as related to children and family issues. Strategies for advocacy will be emphasized. Lecture three hours per week.

**HESC455V Special Topics (1-6) (IR)** Topics not covered in other courses, a focused study of specific topics in the students' areas of concentration.

**HESC4613 Food Service Purchasing (FA)** Food purchasing with emphasis on specifications. Relationship of food purchasing to available equipment. Receiving, storage, distribution, and inventory control. Meal quality control and costing. Lecture 3 hours per week. Prerequisite: HESC 3653 and HESC 3604.

**HESC4623 Selection and Layout of Food Service Equipment (SP)** Types of food service. Planning food flow from receiving to service of meals. Choosing proper equipment for the flow plan and service items. Sanitation, maintenance, comparison of personnel requirements. Lecture 3 hours per week. Prerequisite: HESC 3653 and HESC 3604.

**HESC4693 Hospitality Management Internship**

(FA, SP, SU) Practical experience in a hotel or food service facility that offers management experience to develop insight into purchasing, production, planning, tourism and other customer accommodation concepts within the industry. May be repeated for 3 hours. Prerequisite: HESC 1213 and HESC 3604 and HESC 3653.

**HESC4753 Family as Consumers (FA)** Economic considerations of the family in a rapidly changing society. Family finance and consumer problems are emphasized.

**HESC4803 Advanced Residential Design (FA)** Advanced studio problems involving residential spaces. Design for new construction, remodeling, and restoration projects for a variety of lifestyles, budgets, physical conditions and lifecycle stages. Projects address the entire design process from concept development through presentation. Prerequisite: HESC 3813.

**HESC4813 Human Factors in Interior Design (SP)** (Formerly HESC 3823). Emphasis is given to human behavior as applied to interior design. Types of interior spaces, environmental effects on behavior, ergonomics, interior design needs of special groups, and human factors programs are studied. Lecture 3 hours per week. Prerequisite: SOCI 2013 and PSYC 2003 and junior level standing.

**HESC4811 Internship for Interior Design (SU)** Summer supervised work experience and observation of operations/management procedures in approved design, government or service business. HESC 4843 must be completed in spring prior to internship. Prerequisite: HESC 3813 and HESC 4843.

**HESC4823 Professional Practice for Interior Design (FA)** General procedures for operating and maintaining an interior design business. Business documentation, communication and computer application skills, professional responsibilities and ethics. Lecture 3 hours per week. Prerequisite: HESC 3813.

**HESC4843 Interior Design Internship Preparation (SP)** Preparation for interior design internship, including resume writing, portfolio development, and other job search strategies. Students are responsible for research and selection of internship site. Lecture 3 hours per week. Must be taken spring semester prior to summer internship experience. May be repeated for 3 hours. Prerequisite: junior standing.

**HESC485V Design Tours (1-3) (IR)** Domestic and international study tours of a variety of design locations that contribute to the body of knowledge. Prerequisite: HESC 1045.

**HESC4863 Studio VI: Advanced Commercial Design (SP)** Advanced contract studio involving all aspects of a major project and its presentation. Comprehensive design solutions for programmatic requirements and complex design and solutions. Studio 6 hours per week. Prerequisite: HESC 4803.

**HESC4891 Senior Portfolio (SP)** (Formerly HESC 4893) Continuation of HESC 4843 internship preparation. Professional portfolio preparation. Presentation of portfolio at annual exhibition is required. Studio 2 hours per week. Prerequisite: HESC 4843 and HESC 4803.

**HESC502V Special Problems Research (1-6) (FA, SP, SU)**

**HESC5203 Special Topics in Nutrition (SP)** Critical review of current literature; reports and discussion of original nutrition research pertinent to the topic(s) identified for study. Lecture/seminar format 3 hours per week. May be repeated. Prerequisite: HESC 4213 (or ANSC 4143) and CHEM 3813.

**HESC522V Readings in Nutrition (1-6) (FA, SP, SU)** Seminar and individual study. Prerequisite: HESC 4213 or HESC 4223.

**HESC5403 Advanced Family Relations (FA)** Subtle elements in marriage, parent-child, and other relations among family members and between the family and the larger community. Recent cultural change as it affects the family. Recent research and literature. Prerequisite: graduate standing.

**HESC5423 Theories of Human Development (FA)** Classic and contemporary theories and theoretical issues concerning human development across the life span. Prerequisite: graduate standing.

**HESC5433 Advanced Child Development (SP)** Theory and research concerning normal behavior and development in childhood. Acquaintance with library resources, classic studies, and recent literature.

**HESC5463 Research Methodology in Social Sciences (SP)** 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. (Same as AGECE 5013, AGED 5463)  
Prerequisite: Any upper division (3000 or higher) statistics course.

**HESC555V Special Topics in Human Environmental Sciences (1-3) (IR)** Topics not covered in other courses or a more intensive study of specific topics in the specializations of human environmental sciences. May be repeated.

**HESC600V Master's Thesis (1-6) (FA, SP, SU)**

**HESC700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (HIED) HIGHER EDUCATION

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**HIED5003 Overview-American Higher Education**

(FA) 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.

**HIED5033 College Students and Student**

**Personnel Services (FA)** 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.

**HIED5043 The Student in Higher Education (SP)**

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.

**HIED504V Practicum in Higher Education (1-6)**

(FA, SP, SU) 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.

**HIED5053 The Community-Junior College (FA)**

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.

**HIED5083 History and Philosophy of Higher**

**Education (SP)** An examination of the history and development of higher education including the study of the philosophy, objectives, and functions of various types of institutions.

**HIED560V Workshop (1-6) (IR)**

Practical and concentrated consideration of selected topics of current interest to practitioners.

**HIED574V Internship (1-3) (FA, SP, SU)**

Supervised field experiences in student personnel services, college administration, academic advising, institutional research, development, or other areas of college and university work.

**HIED600V Master's Thesis (1-6) (FA, SP, SU)**

**HIED6013 The Professoriate: Problems and**

**Issues (SP)** An examination of the vital issues and trends affecting college faculty personnel with emphasis upon institutional practices and policies.

**HIED6022 Introduction to the Study of Higher**

**Education (FA, SP)** 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 program (Ed.S. & Ed.D.)

**HIED605V Independent Study (1-6) (FA, SP, SU)**

Provides students with an opportunity to pursue special study in higher education.

**HIED6073 Management of Higher Education**

**Institutions (SU)** Principles and concepts of management and their application in college and university settings.

**HIED6173 Individual and Group Management**

**Skills (SP, Even years)** Development of knowledge, skill, and confidence in personal management, interpersonal relations, and structured group facilitation in a higher education setting.

**HIED6183 Organization Development and Change**

**in Higher Education (IR)** An examination of the theory and practice of organization development as it relates to planned change in colleges and universities.

**HIED6323 Design and Evaluation of College**

**Teaching (FA, SU)** Theory and practice of effective college teaching. Emphasis is placed on preparation and evaluation of instruction.

**HIED6333 Curriculum Design in Higher Education**

(FA, Odd years) Types of undergraduate curricula and their supporting philosophies; approaches to curricula planning and assessment; curricular reforms; and factors influencing curricular policy making.

**HIED6343 Strategies for Effective College**

**Teaching (SP, Even years)** An examination of traditional and innovative instructional strategies for use in college teaching.

**HIED6423 Trends, Issues and Problems in Higher**

**Education (FA, Odd years)** A study of the current problems and trends related to the field of higher education.

**HIED6653 Legal Aspects of Higher Education**

(SP) 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.

**HIED6663 Finance and Fiscal Management (SP)**

Higher education finance and budgeting practices; problems, issues, trends, and policy issues in higher education.

**HIED6683 Governance and Policy Making in**

**Higher Education (FA, Odd years)** 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.

**HIED674V Internship (1-6) (FA, SP, SU)**

Supervised field experiences in student personnel services, college administration, college teaching, institutional research, development, or other areas of college and university work.

**HIED680V Ed.S. Project (1-6) (FA, SP, SU)**

**HIED699V Seminar (1-6) (FA, SP, SU)** 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.

**HIED700V Doctoral Dissertation (1-18) (FA, SP,**

**SU)** Prerequisite: candidacy.

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## (HIST) HISTORY

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**HIST1113 Institutions and Ideas of World**

**Civilizations (FA)** Introduces the major civilizations of the world in their historical context to 1500.

**HIST1113H Honors World Civilization (FA, SP, SU)**

Study of Western and non-Western civilizations.

**HIST1123 Institution and Ideas of World**

**Civilizations (SP)** Introduces the major civilizations of the world in their historical context, since 1500.

**HIST1123H Honors World Civilization (FA, SP, SU)**

Study of Western and non-Western civilizations.

**HIST2003 History of the American People to 1877**

(FA, SP, SU) A history of American life encompassing constitutional, political, social, intellectual and economic development from prior to European colonization to 1877.

**HIST2003H Honors History of the American**

**People to 1877 (FA, SP, SU)** A history of American life encompassing constitutional, political, social, intellectual and economic development from prior to European colonization to 1877. Particular emphasis will be placed on the evolution of American political institutions.

**HIST2013 History of the American People, 1877**

**to Present (FA, SP, SU)** A history of American life encompassing constitutional, political, social, intellectual and economic development from Reconstruction to the present.

**HIST3003 History of Christianity (IR)**

This course surveys the theological, political, and cultural history of Mediterranean Christianity, c. 30-600 CE. Special topics include patristics, Christianity and Empire, and the formation of Christian sacred space.

**HIST3033 Islamic Civilization (FA, Odd years)**

A survey of the foundation, evolution, and distinctive character of Islam, with attention to religion, literature, art, architecture, science, and political society. Particular attention given to the development of Islamic doctrines, sectarian movements, and systematic theology. Concludes with a look at Islamic resurgence movements and their place in the contemporary world.

**HIST3043 History of the Modern Middle East (FA,**

**Odd years)** Examines the history of the Islamic Middle East

from the rise of the Ottoman and Safavid Persian empires up to World War I and then concludes with the issues and patterns of 20th century Middle Eastern political and socio-economic life. Topics include Islam and politics, Arab nationalism, Western imperialism, the Arab-Zionist conflict, petroleum politics, and modernization vs traditionalism.

**HIST3063 Military History (IR)**

Survey of the basic principles and problems of strategy, tactics, and military organization from Alexander the Great to the present. Special attention will be given to the operation of these factors in the American Revolution, the Napoleonic Wars, the American Civil War, and World War II.

**HIST3083 Women and Christianity (FA, SP, SU)**

From Paul to the mystics of the late medieval church, this course considers women's religious expression, symbolic action, interaction with holy men, and their relationship with the ecclesiastical hierarchy. Other important questions include women's institutional subordination opportunities for autonomous action.

**HIST3203 Colonial Latin America (FA)**

An introduction to the social, cultural, political and economic formation of Latin America, during the period from 1492 to the movements for independence.

**HIST3213 Modern Latin America (SP)**

An investigation of the varying courses of modernization in Latin America, covering popular revolution, urban populism and military dictatorship.

**HIST3233 African American History to 1877 (FA)**

The course will study the African beginnings, the Caribbean and Latin American influences, and the African American early struggle to survive slavery in the new world, and the continuing social, political, and economic quest to become a first class citizen in American society until Reconstruction, 1492-1877.

**HIST3243 African American History Since 1877**

(SP) The course will study the major social, political, and economic issues relating to the African American experience beginning with the late post-Reconstruction period and will include, all of the major personalities and influences in the Civil Rights Movement, from 1877 to the present.

**HIST3263 History of the American Indian (FA)**

Survey of North American Indian history from their arrival include pre-Columbian Indian history, the interaction of Indian and white societies, U.S. Government policy, and the role of Indians in modern American culture.

**HIST3323 The West of the Imagination (IR)**

The changing image of the American West from the colonial period to the present and how popular impressions have reflected national attitudes and values. Special attention given to the West's portrayal in folklore, literature, art, films, and television.

**HIST3383 Arkansas and the Southwest (SP)**

Political, economic, social, and cultural development of Arkansas from the coming of the Indian to the 20th century, with special emphasis on Arkansas as a national and regional component.

**HIST3443 Modern Imperialism (FA, Even years)**

Considers the causes and consequences of the rise of European overseas empires after 1870 as well as their subsequent decline after World War II. Special emphasis on the British Imperial experience.

**HIST3473 Palestine and Israel in Modern Times**

(FA, Even years) History of 19th-20th Century Palestine, Zionism and the founding of modern Israel, and the Palestine-Israel conflict in local and regional perspective.

**HIST3503 Far East in Modern Times (SP, Even**

**years)** Introduction to fundamental aspects of Chinese, Japanese, Korean, and Vietnamese history since about 1860.

**HIST3533 World War II (SP)**

Study of the causes, conduct and consequences of the Second World War.

**HIST3583 The United States and Vietnam, 1945-**

**1975 (SP)** A survey and analysis of the Vietnam War with special emphasis on its impact on American and Indochinese society.

**HIST3593 The Unraveling of America: Life in the**

**1960s (FA)** A study of the main themes and dominant forces shaping American history during the 1960s; social and cultural as well as political and economic history are emphasized. Topics include the civil rights movement, the Great Society and the Vietnam War as well as the counterculture, rock music and the re-emergence of feminism.

**HIST3923H Honors Colloquium (IR)**

Treats a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in history).

**HIST3973H Honors Methods (FA, SP, SU)**

An introduction to historiography, the definitions of history, and an exploration of the social function of studying the past.



Examines research methods and current theories of interpreting and evaluating the past. Prerequisite: junior standing.

**HIST398V Special Topics (1-3) (FA, SP, SU)**

Historical topics that are not usually presented in depth in regular courses. May be repeated.

**HIST399VH Honors History Thesis (1-6) (FA, SP, SU)** May be repeated for 12 hours. Prerequisite: junior standing.

**HIST4003 Greece and the Ancient Near East (FA, Odd years)** An introduction to the origins of civilization in the ancient Near East and Greece. Emphasis placed upon the development of agriculture and cities, Hebrew religious ethics, and Greek culture, political institutions, and thought.

**HIST4013 Alexander the Great and the Hellenistic World (SP, Even years)** 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.

**HIST4023 The Roman Republic and Empire (FA, Even years)** An introduction to Rome's cultural development from its origins as a small city state in the 8th century B.C. to its rule over a vast empire extending from Scotland to Iraq. Emphasis is placed upon the causes of Roman expansion during the Republic, the urbanization and Romanization of Western Europe, and the persecution and spread of Christianity.

**HIST4043 Late Antiquity and the Early Middle Ages (IR)** 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.

**HIST4053 Late Middle Ages (IR)** 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.

**HIST4073 Renaissance and Reformation, 1300-1600 (FA, Even years)** 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.

**HIST4083 Early Modern Europe, 1600-1800 (SP, Odd years)** 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.

**HIST4103 Europe in the 19th Century (IR)**

European history from the Congress of Vienna to the outbreak of World War I, with emphasis on political and diplomatic history.

**HIST4113 Twentieth Century Europe, 1898-1939 (FA, Even years)** Background and impact of World War I to the outbreak of World War II.

**HIST4133 Society and Gender in Modern Europe (SP, Odd years)** 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.

**HIST4143 Intellectual History of Europe Since the Enlightenment (FA, Even years)** A survey of the major developments in European thought and culture since the emergence of Romanticism. Topics include Romanticism, Darwinism, Marxism, and Modernism.

**HIST4163 Tudor-Stuart England (FA, Even years)** Examines the history of England from the Henrician Reformation of the early 16th century through the Glorious Revolution of 1688 to the early 18th century. The Elizabethan Renaissance, the rise of Puritanism, the Revolution of the 1640s and the creation of an overseas empire are given special consideration.

**HIST4173 The Latin American City (IR)** 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.

**HIST4183 Great Britain, 1780-1914: Industry and Empire (SP, Even years)** An inquiry into effects of

industrialization, class consciousness and imperialism on British politics, culture and society during the Victorian Era.

**HIST4193 Great Britain, 1901-1982: Empire to Welfare State (SP, Even years)** Consideration of Imperial Britain from the Angle-Boer conflict to the Falkland Islands War, with emphasis on the effects of the Great Depression and the emergence of the modern welfare state.

**HIST4213 The Era of the French Revolution (FA)** France in Old Regime, the Enlightenment, and the French Revolution.

**HIST4223 France Since 1815 (SP, Even years)** Survey of French history from the overthrow of Napoleon to the 5th Republic, with emphasis on French politics, society, and culture.

**HIST4243 Germany, 1789-1918 (FA, Even years)** Survey of Germany from Age of Absolutism to collapse of the Hohenzollern monarchy with emphasis upon political, social, and economic developments.

**HIST4253 History of Germany, 1918-1949 (FA)** Survey of Germany from advent of the Weimar Republic to 1949 with emphasis upon the failure of democratic government in the 1920s, the National Socialist dictatorship, and the division of Germany into two separate states.

**HIST4283 Russia to 1861 (FA)** Study of the political, social and cultural development of Russia through the Napoleonic invasion.

**HIST4293 Russia Since 1861 (SP)** Survey of political, cultural and intellectual trends in modern Russia with emphasis upon the Revolutions of 1917, the Soviet Union, and its successor states.

**HIST4313 History of China to 1644 (FA, Odd years)** A history of pre-modern China, including the study of Confucianism, Taoism and Buddhism.

**HIST4323 Modern China (SP, Odd years)** Survey of Chinese culture, society, government and diplomacy between 1644 and 1912.

**HIST4343 Modern Japan (IR)** Survey of Japanese history since 1859 to the downfall of Tokugawa shogunate through the two world wars to the rise of an economic superpower. Emphasis is placed on Japanese economic, social, and political questions, including their successes and costs.

**HIST4353 Middle East, 600-1500 (FA, Even years)** An examination of the origins of modern Middle Eastern societies-Arabic, Turkish, and Persian-with emphasis upon the development of the Islamic faith and culture.

**HIST4373 Mongol & Mamiuk Middle East 1250-1520 (SP, Even years)** An examination of Egypt, the Fertile Crescent, and Iran in the period of the Turco-Mongol military elites. Special attention given to the rise of slave and free governments and their roles in shaping Middle East political and social patterns.

**HIST4383 The History of Sub-Saharan Africa (IR)** A survey of the history of the major political, economic, and social institutions of Africa with the major emphasis on the civilizations of West Africa.

**HIST4393 The Ottoman Empire and Iran 1300-1722 (SP, Odd years)** An examination of Ottoman government and society in the Classical Period as well as a survey of Iranian history from 1300 to 1722. Special attention given to the Ottoman ruling structure, religious-legal establishment, and Ottoman conquests in the Balkans and Arab world.

**HIST4413 New Women in the Middle East (SP, Odd years)** 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.

**HIST4423 The Mediterranean World (FA, Even years)** An introduction to the Mediterranean as a region, including both its northern and southern shores. Cultural, economic, and political themes are pursued regionally from the 16th century until present.

**HIST4433 Social and Cultural History of the Modern Middle East (SP, Odd years)** An analysis of Middle East history in the 17th-20th centuries that focuses on the social transformation of urban and rural life. Particular emphasis is given to the roles of economics, genealogy, art, and popular culture.

**HIST4453 American Ethnic History (FA, SP, SU)** Covers issues of ethnicity and assimilation not covered in courses on African-American and Native American history. Focus is threefold: the experience of immigrants and their descendants; the reactions of government, popular movements, and influential opinion-makers to immigrants; and changes in immigration policy.

**HIST4463 The American Frontier (SP)** 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.

**HIST4473 Environmental History (IR)** 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.

**HIST4483 Diplomatic History of U.S. 1890 to 1960 (FA, SP, SU)** America's development as a world power from the Spanish-American War to Vietnam. Particular emphasis is placed on the Middle East, Europe, Latin America, and East Asia.

**HIST4493 Religion in America to 1860 (IR)** 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.

**HIST4503 History of Political Parties in the United States, 1789-1896 (FA, Even years)** Origin and development of the American party system from the implementation of the constitution to the election of McKinley.

**HIST4513 History of Political Parties in the United States Since 1896 (SP, Odd years)** Response of the party system to America's emergence as an industrial nation and world power from the election of 1896 to present.

**HIST4533 American Social and Intellectual History to 1865 (FA)** Survey of significant ideas and institutions from Colonial times through the Civil War with emphasis upon religious, educational, literary, and scientific developments.

**HIST4543 American Social and Intellectual History Since 1865 (IR)** Survey of thought and society since the Civil War with emphasis upon the nature of American life in the 20th century.

**HIST4563 The Old South, 1607-1865 (FA, Odd years)** Survey of the political, social, and economic development of the antebellum South.

**HIST4573 The New South, 1860 to the Present (FA, Even years)** Survey of the development of the Civil War and postwar South to the present.

**HIST4613 Colonial America to 1763 (FA)** Political, economic, and social history of colonial development from the time of contact to the Treaty of Paris, with primary, but not exclusive, emphasis upon Anglo-America.

**HIST4623 Revolutionary America, 1763 to 1801 (SP)** Political, economic, and social history of Revolutionary and post-Revolutionary America and the evolution of the new nation, with a particular emphasis upon the emergence on constitutional traditions.

**HIST4643 Early American Republican, 1801-1828 (FA, SP)** History of the early United States emphasizing social and cultural perspectives. Topics addressed will include westward expansion, slavery, religion, and economic change.

**HIST4653 Antebellum America, 1828-1850 (FA, SP)** History of antebellum U.S. emphasizing social and cultural perspectives. Topics addressed will include slavery, religion, gender, the market economy, regionalism, and political developments.

**HIST4663 Rebellion to Reconstruction, 1850-1877 (SP, Even years)** 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.

**HIST4673 The American Civil War (FA)** An intensive study of the political, social, military, and economic aspects of the American Civil War period.

**HIST4703 Emergence of Modern America, 1876-1917 (FA)** A survey of the impact of the Industrial Revolution, Imperialism, and progressivism upon American life and institutions.

**HIST4723 America Between the Wars, 1917-1941 (SP)** The impact of World War I, the 1920s, and the Great Depression upon American society and culture.

**HIST4733 Recent America, 1941 to the Present (SP)** A general survey of American history since World War II with emphasis upon the presidency, reform movements, the Cold War, and cultural developments.

**HIST4743 History of Brazil** (SP, Even years) A survey of five centuries of a new world in the tropics, covering exploration and settlement, slavery and expert monoculture, industrialization, and popular culture.

**HIST4773 Arkansas in the Nation** (FA) 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.

**HIST498V Senior Thesis** (1-6) (FA, SP, SU)

**HIST5023 Historical Methods** (FA) Practical introduction to historical research and writing. Consists of lecture, library reading, and class criticism of research papers. Prerequisite: graduate standing.

**HIST5043 Historiography** (SP) Survey of the history of historical writing and a study of the important schools and historical interpretation. Prerequisite: graduate standing.

**HIST5053 Reading Seminar in Asian History** (FA, SP, SU) Concentrated reading in selected specialized areas of Asian history. Prerequisite: advanced graduate standing.

**HIST506V Readings in European History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST507V Readings in American History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST508V Research Problems in European History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST509V Research Problems in American History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST5103 Reading Seminar in American History** (FA, SP, SU) Historiographical and bibliographical study of special areas of U.S. history, such as the Age of Jackson, the Civil War, etc. Prerequisite: graduate standing.

**HIST5123 Research Seminar in American History** (FA, SP, SU) Research projects in selected fields of American history, such as the Civil War, the Age of Jackson, etc. Prerequisite: graduate standing.

**HIST5133 Reading Seminar in European History** (FA, SP, SU) 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.

**HIST5143 Research Seminar in European History** (FA, SP, SU) Research projects in selected fields of European history, such as the French Revolution, humanism, etc. Prerequisite: graduate standing.

**HIST5163 Research Seminar in British History** (FA, SP, SU) Research projects in selected fields of British history.

**HIST517V Readings in Asian History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST519V Readings in Near Eastern History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST520V Research Problems in Near Eastern History (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST5213 Reading Seminar in Middle Eastern History** (FA, SP, SU) Historiographical and bibliographical study of special areas of Middle Eastern history. Prerequisite: graduate standing.

**HIST5233 Research Seminar in Middle Eastern History** (FA, SP, SU) Research projects in selected fields of Middle Eastern history. Prerequisite: graduate standing.

**HIST560V Teaching Foreign Cultures in Social Studies Curriculum (1-6)** (SU) Extensive examination of foreign cultures (West Europe, USSR, China, Latin America) and methods of teaching about them in secondary school social studies. Four week residential summer institute.

**HIST600V Master's Thesis (1-6)** (FA, SP, SU) Prerequisite: graduate standing.

**HIST700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

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## (HKRD) HEALTH SCIENCE, KINESIOLOGY, RECREATION AND DANCE

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**HKRD480V Workshop (1-18)** (FA, SP, SU)

**HKRD5353 Research in Health Science, Kinesiology, Recreation and Dance** (FA, SP, SU)

Methods and techniques of research in health education, physical education and recreation including an analysis of examples of their use and practice in their application to problems of interest to the student.

**HKRD5373 Problems in Health Science, Kinesiology, Recreation, and Dance** (SU) A study of current problems in the field of health education, kinesiology, and recreation.

**HKRD560V Workshop (1-3)** (FA, SP, SU)

**HKRD5873 Leadership in HKRD Services** (FA) Considers research, theory, and practical applications of leadership principles utilized in the provision of HKRD services. Focus is on motivation, attitude, communication, group dynamics, and problem solving.

**HKRD5883 Sports Facilities Management** (FA) Considers basic elements and procedures in the planning, design, construction, operation, and maintenance of sport facilities; management considerations in conducting various types of events.

**HKRD5893 Public and Private Finance in HKRD** (FA, SP, SU) 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.

**HKRD5983 Health Promotion at the Workplace** (FA, SP, SU) Examines specific for health promotion programming, organizational and administrative schemes for program delivery, and appraisal systems for determining health programming priorities in workplace settings.

**HKRD599V Seminar (1-3)** (FA, SP, SU)

**HKRD6133 Issues in HKRD** (SU) A review of the significant social, demographic, behavioral, developmental, and technological issues that influence health, kinesiology, and recreation programs. Pre- or Corequisite: for doctoral level students only.

**HKRD6233 Management in HKRD** (SP) 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.

**HKRD6333 Measurement in HKRD** (SP, SU) Competencies for analysis and application of evaluation and measurement in HKRD.

**HKRD660V Workshop (1-3)** (FA, SP, SU)

**HKRD689V Directed Research (1-6)** (FA, SP, SU) Laboratory investigations, in basic and applied research.

**HKRD699V Seminar (1-3)** (FA, SP, SU)

**HKRD700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

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## (HLSC) HEALTH SCIENCE

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**HLSC1002 Wellness Concepts** (FA, SP, SU) Interrelationship of mental, emotional, physical, social, and spiritual aspects of functioning to optimal health and wellness; implications for education about wellness in the schools and for adult living are provided.

**HLSC1103 Personal Health and Safety** (FA, SP, SU) Health and safety problems with emphasis on the promotion of individual health and safety.

**HLSC1203 Prevention of Drug Abuse** (FA, SP, SU) Provides an overview of drugs of use and abuse in society. Also assists the student in evaluating drug abuse prevention approaches for public, private, or community settings.

**HLSC1303 Introduction to Human Sexuality** (FA) An examination of human sexuality with a critical analysis of male and female attitudes and values affection self-understanding and gender identity.

**HLSC2101 Special Topics** (FA, SP, SU) Examination and application of health promotion concepts based on individualized health hazard appraisal. (Not to replace content courses leading to teacher certification in health education). May be repeated for 5 hours.

**HLSC2613 Foundations in Health Education** (FA, SP, SU) History and philosophy of health education discipline; organization and administration of health education programs; curriculum development and evaluation of educational efforts; and student observation in school and non-school settings.

**HLSC2653 Introduction to Community Health** (FA) An exploration of technological approaches for maintaining, protecting, and improving the health of the people through organized community efforts.

**HLSC2662 Terminology for the Health Professions** (FA, SP) Emphasis is on word roots and combined forms of words describing various facets of health and disease. Descriptive definitions with application of practical significance included for the health professional.

**HLSC3003 Practicum in Community Health** (FA, SP, SU) Supervised short-term work experience in various community health programs, designed to provide students with comprehensive view of the community health field.

**HLSC310V Readings in Health Science (1-3)** (FA, SP, SU) Synthesis and critical analysis of current literature in the health sciences. May be repeated for 12 hours.

**HLSC3613 Methods and Materials in Health Education and Safety** (FA, SP, SU) Methods and materials; planning and organizing instruction; preparation of teaching units. Prerequisite: junior standing.

**HLSC3623 Human Diseases** (SP, Odd years) An examination of the variety, behavior, distribution, and management of both infectious and noninfectious diseases in human populations. Prerequisite: ZOO 1004 (or BIOL 1543 and BIOL 1541L).

**HLSC3633 First Responder-First Aid** (FA, SP, SU) Prepares persons to administer cardiopulmonary resuscitation and emergency aid to victims of serious bleeding, poisoning, shock, fracture, and other forms of injury until emergency medical services personnel arrive at the scene.

**HLSC3643 Community Health Planning and Promotion** (FA, SP, SU) Emphasis on community analysis; defining and verifying community health problems; establishing program goals; defining and assessing health behaviors; formulating educational goals, objectives, methods, and activities; promoting programs; and designing program evaluation.

**HLSC3663 Principles and Practice of Mental Health Promotion** (FA) Understanding and practicing the principles of sound mental health are key elements in achieving high level wellness. This course encourages students exploration of the mental dimensions of holistic health and presents strategies to achieve a more healthful balance in life.

**HLSC3673 Teacher Drug Education** (FA) Specifically for educators; provides an overview of drugs of use, misuse, and abuse in society, and assists the educator in developing a sequential drug education program in public, private, or community educational settings.

**HLSC3683 Health Care Consumerism** (SP) Study of products and services provided by the health care delivery system; an analysis of those components lacking scientific credibility, yet promoted for the maintenance or restoration of health status.

**HLSC4013 Emergency Medical Care I** (FA) Initial phase of training that emphasizes the development of student skill in recognition of symptoms of illness, injuries, and proper procedures of emergency care presently considered with the responsibilities of the emergency medical technician. Corequisite: HLSC 4011L.

**HLSC4011L Emergency Medical Care I Laboratory** (FA) A required laboratory component for students enrolled in Emergency Medical Care I. Emphasis is on the development of specific hands-on competencies in the assessment and treatment of the trauma and/or medical patient utilizing appropriate adjunctive equipment. Corequisite: HLSC 4013.

**HLSC4023 Emergency Medical Care II** (SP) Final phase of training that emphasizes life threatening emergencies, childbirth and problems of child patients, environmental emergencies, extrication from automobiles and all operational aspects of the emergency vehicle. Also included will be 15 hours of hospital emergency room and ambulance experience. Corequisite: HLSC 4021L.

**HLSC4021L Emergency Medical Care II Laboratory** (SP) A required laboratory component for students enrolled in Emergency Medical Care II. Emphasis is on the development of specific hands-on competencies in the assessment and treatment of the trauma and/or medical patient utilizing appropriate adjunctive equipment. Corequisite: HLSC 4023.



**HLSC404V Community Health Preceptorship (6-12)** (FA, SP, SU) Designed to provide the student with an extended work experience in a selected community health program. The student works under college supervision with a professional in the health care delivery field. Prerequisite: senior standing.

**HLSC475V Student Teaching (5-10)** (FA, SP, SU) Involves time and an off-campus school where student teacher will have an opportunity under supervision to observe, to teach and participate in other activities involving the school and the community.

**HLSC5353 Health Counseling** (SP) 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. (Same as CNED 5353)

**HLSC5543 Contemporary Issues in Human Sexuality** (FA) In-depth analysis of the social, biological, and behavioral factors associated with the development of one's sexuality.

**HLSC5553 School Health Programs** (FA) Study of program content, program organization, and administrative details in planning and conducting a school program that includes healthful school living, health services, and health instruction.

**HLSC5563 Public Health** (FA) Acquaints the student with the structure, functions, and major problems in public health and with the role of education in public health.

**HLSC5573 Principles of Health Education** (FA, SP, SU) Current trends, basic issues, controversial issues, and fundamental principles of health education.

**HLSC560V Workshop (1-6)** (IR)

**HLSC5613 Principles of Epidemiology** (FA, SP, SU) Distribution and patterns of disease or physiological conditions within populations; an examination of the nature of epidemiological research.

**HLSC5623 Health Planning** (FA, SP, SU) Emphasis is on examination of health planning processes, principles, and concepts. Methods for health planning agencies, issues in comprehensive health planning, and analysis of decision making steps for program implementation will be addressed.

**HLSC5633 Health Services Administration** (FA, SP, SU) 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.

**HLSC574V Internship (1-6)** (IR)

**HLSC589V Independent Research (1-6)** (FA, SP, SU) Development, implementation, and completion of graduate research project. Prerequisite: M.S. degree in health science and HPER 5353 and EDFD 5393.

**HLSC599V Seminar (1-3)** (IR) May be repeated for 18 hours.

**HLSC600V Master's Thesis (1-6)** (FA, SP, SU)

**HLSC605V Independent Study (1-6)** (FA, SP, SU) Provides students with an opportunity to pursue special study of education problems.

**HLSC6333 Health Behavior Research** (FA) A review of human behavior and its relationship to health and well being. Focuses on contemporary health behavior research and instrumentation.

**HLSC6443 Health & Health Care in Cross-Cultural Settings** (FA, SP, SU) The relationship of socio-political and cultural factors to primary health care and public health in developed and developing countries is emphasized. Epidemiological factors influencing health status in various countries are reviewed.

**HLSC6553 Environmental Health** (FA, SP, SU) 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.

**HLSC6733 Health and the Aging Process** (FA, SP, SU) An overview of the health-related issues facing elderly populations with in-depth study of the biological and behavioral changes associated with aging.

**HLSC674V Internship (1-3)** (FA, SP, SU) Provide Ph.D. students with an individualized college teaching experience in collaboration with a faculty mentor. Enrollment concurrent with residency. Prerequisite: admission to the Ph.D. in Health Science degree program.

**HLSC6833 Principles of Epidemiology II** (FA, SP, SU) 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. Prerequisite: EDFD 5393 or EDFD 6403.

**HLSC699V Seminar (1-3)** (FA, SP, SU) Discussion of selected topics and review of current literature in the health sciences. Prerequisite: advanced graduate standing.

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## (HNED) HONORS

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### *College of Education and Health Professions*

**HNED1001H Honors Leadership Skills** (FA, SP, SU) Designed to help the Honors student identify and implement leadership and organization development activities. Prerequisite: honors candidacy.

**HNED1013H Honors Literacy Tutoring** (FA, SP, SU) Addresses problems of meeting the educational needs of an illiterate adult population, including the socio-economic factors contributing to illiteracy and educational programs designed to remediate the problem. Prerequisite: honors candidacy.

**HNED3001H Honors Education Thesis Tutorial** (FA, SP, SU) Designed to provide the foundation for the Honors Thesis. Students and faculty tutors work "one-on-one" exploring a specific topic that has been agreed upon by the student and the professor. May be repeated for 6 hours. Prerequisite: honors candidacy.

**HNED3923H Honors Education Seminar** (IR) Special topics or issues in education for the Honors student. May be repeated. Prerequisite: honors candidacy.

**HNED4003H Honors Education Thesis/Project** (FA, SP, SU) Prerequisite: honors candidacy and HNED 3001H.

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## (HORT) HORTICULTURE

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**HORT100V Special Topics (1-4)** (FA, SP, SU) Topics not covered in other courses or a more intensive study of specific topics in Horticulture. May be repeated.

**HORT1103 Plants in the Home Environment** (FA) A course describing the aesthetic, nutritional and health value, and other importance of plants to humans. The course will highlight the use and importance of plants and gardening through the ages, study significant gardens to humankind, and introduce students to using plants to their benefit. The use of color, texture, aroma and flavor in the home and landscape will be presented. Basic home gardening, plant care and use will be discussed and practiced.

**HORT1203 Introduction to Plant Sciences** (FA, SP) An introduction to basics of agricultural crop plant structure, growth, and production.

**HORT2003 Principles of Horticulture** (FA, SP) A course introducing students to the biological and technologies underlying the propagation, production, handling and use of horticultural crops, turf and landscape plants. Students will be introduced to the various disciplines and commodities of horticulture. The use of plants for the benefit of humankind because of their aesthetic and nutritional value will be explored. Previous instruction in Plant Science, Plant Biology, or general Botany is strongly encouraged. Lecture 2 hours, laboratory 2 hours, drill 1 hour per week. Corequisite: HORT 2000L.

**HORT2000L Principles of Horticulture Laboratory** (FA, SP) Corequisite: HORT 2003.

**HORT2303 Introduction to Turfgrass Management** (FA) An introductory course in turfgrass management emphasizing turfgrass growth, adaptation, and management. Methods for establishment, fertilization, mowing, cultivation, irrigation, and pest management are presented, and their impact on culture of lawns, golf courses, athletic fields, and other managed turf areas discussed.

**HORT3103 Woody Landscape Plants** (FA) Identification, climatic adaptation and landscape design values of woody ornamental trees, shrubs and vines. Lecture 2 hours per week. Corequisite: HORT 3100L.

**HORT3100L Woody Landscape Plants Laboratory** (FA) Corequisite: HORT 3103.

**HORT3113 Herbaceous and Indoor Plant Materials** (SP, Odd years) Identification, culture, and use of annuals, perennials in landscapes and foliage plants in

interiors. Lecture 2 hours, laboratory 2 hours per week. Corequisite: HORT 3110L.

**HORT3110L Herbaceous and Indoor Plant Materials Laboratory** (SP, Odd years) Corequisite: HORT 3113.

**HORT3133 Advanced Woody Landscape Plants** (SP, Odd years) Study of rare and unusual plant materials for specific landscape uses and examination of cultivars of commonly used landscape plants. Lecture 2 hours, laboratory 2 hours per week. Corequisite: HORT 3130L. Prerequisite: HORT 3103.

**HORT3130L Advanced Woody Landscape Plants Laboratory** (SP, Odd years) Corequisite: HORT 3133.

**HORT3303 Vegetable Crops** (SP, Even years) General course in vegetable crops with attention to the principles underlying methods of production and handling related to yields and quality of the products. Lecture 2 hours, laboratory 2 hours per week. Corequisite: HORT 3300L. Prerequisite: HORT 2003 and CSES 2203.

**HORT3403 Turfgrass Management** (SP) A laboratory-based course for students to gain practical knowledge and experience in turfgrass information gathering, species identification, calculations, calibration of application equipment, equipment maintenance and troubleshooting, and turfgrass establishment and renovation. Corequisite: HORT 3400L. Prerequisite: BOTY 1613 and BOTY 1611L (or HORT 1203 or AGRN 1203).

**HORT3400L Turfgrass Management Laboratory** (SP) Corequisite: HORT 3403.

**HORT3901 Horticultural Career Development** (SP) A course that presents concepts necessary for developing a career and becoming a professional in horticulture industries or businesses. Concepts of goal setting, effective communication and interpersonal skills, behaviors and performance, portfolio and resume, development and job hunting skills will be presented. Prerequisite: 45 hours completed coursework.

**HORT400V Special Problems (1-6)** (FA, SP, SU) Original investigations on assigned problems in horticulture. Prerequisite: junior standing.

**HORT401V Special Topics in Horticulture, Turf or Landscape (1-6)** (IR) topics relate to horticulture, turfgrass or landscape science or management not covered in other courses or a more intensive study of a specific topic. May be repeated.

**HORT402V Horticulture Judging and Competition Activity (1-3)** (IR) Training for and participation on horticultural identification, judging and competitive teams. Repeatable for up to 4 credits. May be repeated for 4 hours. Prerequisite: HORT 2003.

**HORT4033 Professional Landscape Installation and Construction** (FA, Even years) 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. Prerequisite: HORT 2003 and HORT 3103.

**HORT4043 Professional Landscape Management** (FA, Odd years) (Formerly HORT 3123) 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.

**HORT4103 Fruit Production Science and Technology** (FA, Even years) 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. Corequisites: HORT 4100L. Prerequisites: HORT 2003.

**HORT4100L Fruit Production Science and Technology Lab** (FA, Even years) Corequisite: HORT 4103.

**HORT4403 Plant Propagation** (SP, Even years) 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. Corequisite: HORT 4400L.

**HORT4400L Plant Propagation Laboratory (SP, Even years)** Corequisite: HORT 4403.

**HORT4503 Nursery Management (FA, Odd years)** Principles and practices in the production and handling of woody ornamental stock; management of the retail nursery and garden center. Lecture 2 hours, laboratory 2 hours per week. Corequisite: HORT 4500L. Prerequisite: HORT 2003.

**HORT4500L Nursery Management Laboratory (FA, Odd years)** Corequisite: HORT 4503.

**HORT4603 Practical Landscape Planning (SP, Even years)** Ornamental planting design and landscape planning concepts. Preparing planting plans, materials sheets, and cost estimates for residential properties. Prerequisite: HORT 3103.

**HORT462V Landscape Horticulture Internship (1-6) (FA, SP, SU)** A supervised practical work experience in a nursery or landscape design, maintenance, or contracting business to gain professional competence and insight into employment opportunities. May be repeated for 6 hours. Prerequisite: junior standing.

**HORT463V Horticulture Internship (1-6) (FA, SP, SU)** A supervised practical work experience in a horticultural business or research program to gain professional experience in horticultural operations and insight into employment opportunities. A maximum of 6 hours credit is permitted for degree credit. May be repeated for 6 hours. Prerequisite: minimum of 60 hours completed coursework.

**HORT464V Turf Management Internship (1-9) (FA, SP, SU)** Practical experience in golf course management, sports turf management, residential and/or commercial turf management, turf production or related turf industries. May be repeated for 9 hours. Prerequisite: (60 hours completed coursework or junior standing) and HORT 3901 and (HORT 2303 or HORT 3403 or HORT 4903).

**HORT465V Horticulture Merchandising Internship (1-9) (FA, SP, SU)** Practical work and study experience in companies in Horticultural business management. May be repeated for 9 hours. Prerequisite: (60 hours completed or junior standing) and HORT 3901.

**HORT4703 Greenhouse Management and Controlled Environment Horticulture (FA, Odd years)** 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. Prerequisite: HORT 2003 and CHEM 1074.

**HORT4701L Greenhouse Management and Controlled Environment Horticulture Laboratory (FA, Odd years)** Laboratory involving hands-on experiments designed to demonstrate principles discussed in the lecture section. Includes field trips. Corequisite: HORT 4703.

**HORT4803 Floriculture (SP, Even years)** Principles and practices of production and marketing of containerized floricultural crops commonly produced in controlled environments including flowering containerized herbaceous species, geophytes and annual and perennial bedding plants. Prerequisite: HORT 4703.

**HORT4801L Floriculture Laboratory (SP, Even years)** (Formerly HORT 3200L) Laboratory involving hands-on experiments designed to demonstrate principles discussed in the lecture section. Includes field trips. Corequisite: HORT 4803.

**HORT4903 Golf and Sports Turf Management (FA, Odd years)** Turf management techniques for golf courses, and athletic fields including species selection, root-zone construction and modification, fertilization, mowing, irrigation and pest control. Corequisite: HORT 4900L. Prerequisite: CSES 2203 and CSES 2201L and (HORT 2303 or HORT 3403).

**HORT4900L Golf and Sports Turf Management Laboratory (FA, Odd years)** Corequisite: HORT 4903.

**HORT5001 Seminar (FA, SP)** Review of scientific literature and oral reports on current research in horticulture. May be repeated for 4 hours.

**HORT503V Special Problems Research (1-6) (FA, SP, SU)** Original investigations on assigned problems in horticulture. Prerequisite: graduate standing.

**HORT5043 Advanced Plant Breeding (FA, Odd years)** 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 3323 and BIOL 3321L (or ANSC 3123 and AGRN 4103).

**HORT5343 Seed Physiology (IR)** Physiological process and molecular regulation in the development, dormancy, germination, and early growth of seeds. A basic knowledge of plant physiology expected. (Same as PTSC 5343)

**HORT600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**HORT602V Special Topics in Horticulture (1-3) (IR)** Discussion and advanced studies on selected topics in genetics, plant breeding, physiology and culture of horticultural crops. May be repeated. Prerequisite: graduate standing.

**HORT6033 Genetic Techniques in Plant Breeding (FA, Even years)** 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 3323 and BIOL 3321L (or ANSC 3123 and AGRN 4103 or equivalent).

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## (HUMN) HUMANITIES

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**HUMN1003 Introduction to the Arts and Aesthetics (FA, SP, SU)** An interdisciplinary, multicultural introduction to the arts through general aesthetic concepts and questions, including the nature of artistic media, form, style and interpretation, includes experimental and academic approaches.

**HUMN1003H Honors Introduction to the Arts and Aesthetics (FA)** An interdisciplinary, multicultural introduction to the arts through general aesthetic concepts and questions, including the nature of artistic media, form, style and interpretation, includes experimental and academic approaches.

**HUMN1114H Honors Roots of Culture to 500 C.E. (FA)** This course constitutes the first segment of a four-semester interdisciplinary study of the Egyptian Book of the Dead, the Torah, the Roman Colosseum, Hinduism, and Confucianism. open to first-year Honors students by invitation only. Corequisite: HUMN 1110E.

**HUMN1110E Honors Roots of Culture to 500 C.E. Drill (FA)** This comprises the discussion component of the Roots of Culture to 500 C.E. Required: Candidacy in Four-Year Scholars Program. Corequisite: HUMN 1114H.

**HUMN1124H Honors Equilibrium of Cultures 500-1600 (SP)** This course constitutes the second segment of a four-semester sequence focusing on world cultures. Semester 2 may include the interdisciplinary study of Islam, early Byzantium, Gothic architecture, Heian Japan, and the ancient Maya. Open to first-year Honors students by invitation only. Corequisite: HUMN 1120E.

**HUMN1120E Honors Equilibrium of Cultures 500-1600 Drill (SP)** This comprises the discussion component of the Equilibrium of Cultures, 500-1600 C.E. Required: Candidacy in Four-Year Scholars Program. Corequisite: HUMN 1124H.

**HUMN2003 Introduction to Gender Studies (FA)** This course explores cultural constructions of gender and sexuality using a variety of media, including literature, film, and architecture.

**HUMN2003H Honors Introduction to Gender Studies (FA)** This course explores cultural constructions of gender and sexuality using a variety of media, including literature, film, and architecture.

**HUMN2114H Honors Birth of Modern Culture 1600-1900 (FA)** This course constitutes the third segment of a four-semester sequence focusing on world cultures. Semester 3 may include the interdisciplinary study of Renaissance Venice, feudal Japan, Moghul India, Jefferson's Monticello, and Darwinism. Open to second-year Honors students by invitation only. Corequisite: HUMN 2110E.

**HUMN2110E Honors Birth Culture 1600-1900 Drill (FA)** This comprises the discussion component of the Birth of Modern Culture, 1600-1900. Required: Candidacy in Four-Year Scholars Program. Corequisite: HUMN 2114H.

**HUMN2124H Honors Twentieth Century Global Culture (SP)** This course constitutes the fourth segment of a four-semester sequence focusing on world cultures. Semester 4 may include the interdisciplinary study of the Brooklyn Bridge, the Mexican Revolution, African literature, the Vietnam Memorial, and the atomic age. Open to second-

year Honors students by invitation only. Corequisite: HUMN 2120E.

**HUMN2120E Honors Twentieth Century Global Culture Drill (SP)** This comprises the discussion component of Twentieth Century Global Culture. Required: candidacy in Four-Year Scholars Program. Corequisite: HUMN 2124H.

**HUMN2213 Introduction to World Religions (SP)** A survey of the major religions, including—but not limited to—Hinduism, Buddhism, Judaism, Islam, and Christianity.

**HUMN3003 Religions of Asia (SP)** This course explores the narrative, ritual, and communal practices of Hinduism, Jainism, Buddhism, Taoism, Confucianism, Shinto, Islam, and Sikhism.

**HUMN3163 On Death and Dying (FA, SP, SU)** Reviews the theory and humanistic importance of the concepts of death and dying in society. An experimental option and interdisciplinary faculty presenters will be part of the format. (Same as SCWK 3163) Prerequisite: junior standing.

**HUMN3203 Approaches to Religious Studies (FA)** Introduces students to the academic study of religion from a variety of disciplinary approaches. Topics include the idea of the sacred, myth, ritual, belief, symbol, values, revelation, mysticism. Explores intersections between religions and culture that have an impact on personal and collective identity. Graduate credit cannot be obtained for both HUMN 3203 and HUMN 2203 (deleted).

**HUMN3923H Honors Colloquium (IR)** Treats a special topic or issue offered as a part of the Honors Program. May be repeated. Prerequisite: honors candidacy.

**HUMN4043 Religion and Film (SP)** In Religion and Film we will critique films that explicitly and intelligently portray religious traditions, practices, and culture. In our viewing and our critical work we will face vicariously, but still viscerally, the questions of living religion in personal, social, and cultural contexts.

**HUMN4040D Religion and Film Drill (SP)**

**HUMN4243 Women in Music and Art (FA, SP, SU)** A historical survey of art and music by women from Hildegard von Bingen (1098-c.1179) to Judy Chicago (1939- ).

**HUMN425V Colloquium (1-6) (IR)** An interdisciplinary, value-oriented discussion course. May be repeated for 6 hours.

**HUMN4913 Literary Reflections of the Holocaust (SP)** Drawing on fiction, poetry, autobiography, and drama from works written originally in French, Polish, German, Dutch, English, and Yiddish, this course introduces students to the Holocaust through literature. Deals with the adequacy of imaginative literature in the face of atrocity, the comparative effectiveness of fiction versus autobiography, and the dangers of exploitation and trivialization. (Same as WLIT 4913)

**HUMN4913H Honors Literary Reflections of the Holocaust (SP)** Drawing on fiction, poetry, autobiography, and drama from works written originally in French, Polish, German, Dutch, English, and Yiddish, this course introduces students to the Holocaust through literature. Deals with the adequacy of imaginative literature in the face of atrocity, the comparative effectiveness of fiction versus autobiography, and the dangers of exploitation and trivialization.

**HUMN4993 The City in American Art and Culture (FA, SP, SU)** An examination of the role of the city and the urban experience in American civilization from colonial times to the present. May not be used to satisfy the art history requirement for art majors.

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## (INEG) INDUSTRIAL ENGINEERING

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**INEG1103 Principles of Industrial Engineering (FA)** Considers the past and present roles of the professional industrial engineer and evaluates future trends. Introduces courses to follow and shows their relationship to the systems analysis problems encountered. Corequisite: INEG 1100L.

**INEG1100L Principles of Industrial Engineering Laboratory (FA)** Corequisite: INEG 1103.

**INEG1403 Industrial Cost Analysis (SP)** Use of accounting information for planning and control with emphasis on the engineering viewpoint; introduction to general accounting procedures; principles of cost accounting and other aspects of production costs; budgeting, depreciation, taxes, distribution of profits, securities, sources of corporate capital, interpretation of financial statements, and other related topics. Laboratory required. Corequisite: INEG 1400L.

**INEG1400L Industrial Cost Analysis Laboratory (SP)** Corequisite: INEG 1403.

**INEG2503 Engineering Materials (IR)** Physical, chemical, and electrical properties of engineering materials—metals, plastics, and ceramics. Relation of properties and microstructures to manufacturing processes and to function of fabricated products.

**INEG3113 Law and Ethics (IR)** Analysis of the fundamental legal principles applicable in protecting the rights and interests of engineers and their employers; formation and discharge of contracts; agency relationships; torts; labor laws; patents; trademarks; copyrights; unfair competition, ethics; professional relations. Prerequisite: junior standing.

**INEG3213 Safety Engineering (IR)** Principles of accident and industrial disease prevention; organization and operation of industrial safety and hygiene programs; design problems involving mechanical, electrical, and fluid flow considerations. Prerequisite: sophomore standing.

**INEG3313 Engineering Statistics (FA, SP, SU)** Fundamentals of probability and distribution theory with applications to various branches of engineering; experimental procedures and sample size; statistical decision theory including significance testing and estimation. Drill required. Corequisite: INEG 3310D. Prerequisite: MATH 2564.

**INEG3310D Engineering Statistics Drill (FA, SP, SU)** Corequisite: INEG 3313.

**INEG3413 Engineering Economic Analysis (FA, SP, SU)** Economic aspects of engineering, including current economic problems and the treatment of estimates when evaluating alternative courses of action. Methods of selection and replacement of equipment and break-even points of operation; desirability of new processes or projects where asset life, rate of return on investment, and first, fixed, differential, marginal, and sunk costs must be considered. Corequisite: INEG 3410D. Prerequisite: MATH 2554.

**INEG3410D Engineering Economic Analysis Drill (FA, SP, SU)** Corequisite: INEG 3413.

**INEG3513 Manufacturing System Design (FA, SP)** Basic manufacturing processes and machining fundamentals, metals shaping and removal processes; economic tool life; machinability; machining economics. Selection and design of productive systems to manufacture products. Analysis of manufacturing systems, mechanized assembly, numerical control work centers, and robotics. Laboratory required. Corequisite: INEG 3510L. Prerequisite: GNEG 1122.

**INEG3510L Manufacturing System Design Laboratory (FA, SP)** Corequisite: INEG 3513.

**INEG3613 Introduction to Operations Research (SP)** Simplex method of linear programming, dual problem and sensitivity analysis, transportation and assignment problems, game theory and linear programming; introduction to dynamic programming; deterministic and probabilistic inventory models; project control with PERT/CPM. Prerequisite: INEG 3313.

**INEG3713 Methods and Standards (FA, SP)** Fundamental rules of motion economy; motion analysis by means of charts, diagrams; work place design, tool and equipment selection; operator selection, job description and analysis. Fundamentals of time study; observed and synthetic times; use of standard data and time formula; leveling, rating, allowances, computer program development of latest electronic time study equipment. Laboratory required. Corequisite: INEG 3710L. Prerequisite: INEG 3313.

**INEG3710L Methods and Standards Laboratory (FA, SP)** Corequisite: INEG 3713.

**INEG3833 Data Processing Systems Engineering (FA, Odd years)** Design and analysis of database management systems. Information systems applications development in inventory systems, shop floor control, production scheduling, and various corporate databases. A relational database management system such as Oracle or Access is used. Prerequisite: Computer Elective II.

**INEG399V Special Problems (1-3) (FA, SP, SU)**

**INEG410V Special Problems (1-3) (FA, SP, SU)** Prerequisite: senior standing.

**INEG4121 I. E. Seminar (FA, SP, SU)** Prerequisite: senior standing.

**INEG4223 Occupational Safety and Health Standards (SP)** Survey of existing and proposed standards by examining fundamental physical, economic, and legal bases. Performance vs. specific standards. Enforceability and data collection. National consensus and promulgation process. Includes a computer-based design project. (Same as OMG 4223) Prerequisite: PHYS 2054 or graduate standing.

**INEG4233 Energy Conservation (IR)** Elements of heat gain and heat loss in structures. Analysis and

identification of energy loads in structures; heating load, lighting load, hot water load, distribution and equipment load, and cooling load. Identification and analysis of energy conservation measures. Economic analysis, life-cycle costing, payback period. Case studies and real structure analysis. Prerequisite: INEG 3413 and PHYS 2074.

**INEG4243 Industrial Energy Management (IR)** Analysis of energy use in the industrial environment. Characteristics, quality, quantity, and delivery systems of various industrial energy courses. Identification of major energy consuming items in industry. Energy conservation measures and economic analysis for industry. Prerequisite: INEG 3513 and INEG 3413.

**INEG4323 Quality Engineering and Management (SP)** Provides the student with complete coverage of the functional area of "Quality Assurance" ranging from the need for such a function, how it works, techniques utilized, and managerial approaches for insuring its effectiveness. Prerequisite: senior standing.

**INEG4333 Industrial Statistics (FA, SP)** Application of statistical techniques to industrial problems; relationships between experimental measurements using regression and correlation theory and analysis of variance models; emphasis on inherent variability of production processes; control chart techniques and the use of exponential and Weibull models in reliability analysis; acceptance sampling procedures. Prerequisite: INEG 3313.

**INEG4423 Advanced Engineering Economy (FA)** 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. Prerequisite: INEG 3413.

**INEG4433 Engineering Management (FA)** Studies of cases in engineering administration emphasizing human relationships in a technical environment. Productivity/quality enhancement through an understanding of organizational design and behavior, motivation and reward systems, and participative management. Prerequisite: senior standing.

**INEG4443 Project Management (SP, Odd years)** Analysis of the strategic level of engineering management including environment, planning, organization, and staffing. Professional creativity, motivation, leadership, and ethics are explored. At the tactical level, project selection, control and systems management are analyzed. Organizational behavior and models related to scientific and professional employees are examined. Prerequisite: senior standing.

**INEG4453 Productivity Improvement (SP, Even years)** Analysis of common productivity problems. Development of skills required to: diagnose problems; measure productivity; develop improvement strategies; and provide for the implementation and maintenance of productivity measurement and improvement systems. Prerequisite: senior standing.

**INEG4513 Electronics Manufacturing Processes (FA)** 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. Lecture 2 hours, laboratory 2 hours per week. (Same as ELEG 4273) Corequisite: INEG 4510L. Prerequisite: ELEG 3903 (or ELEG 2103) and INEG 3313 (or STAT 3013).

**INEG4510L Electronics Manufacturing Processes Laboratory (FA)** Corequisite: INEG 4513.

**INEG4523 Automated Production (FA, SP)** Industrial robots and robot programming, industrial logic control systems, programmable controllers for the control of work stations, and conveyor systems. On-line computer control and microprocessors. Group technology, flexible manufacturing systems, and computer-integrated manufacturing. Laboratory required. Corequisite: INEG 4520L. Prerequisite: INEG 3513 or graduate standing.

**INEG4520L Automated Production Laboratory (FA, SP)** Corequisite: INEG 4523.

**INEG4533 Application of Machine Vision (SP)** Automated machine vision applied to assembly and inspection tasks traditionally performed by human operators; development of application by acquiring image, processing image data, analyzing image and transmitting results; application analysis, selection and economics. Laboratory required. Corequisite: INEG 4530L. Prerequisite: senior standing.

**INEG4530L Application of Machine Vision Laboratory (SP)** Corequisite: INEG 4533.

**INEG4543 Materials Handling (FA, SP)** Equipment, systems, problems, and analysis of industrial material handling, with emphasis upon manufacturing. Vehicles, containers and racks, conveyors, overhead systems, and

miscellaneous equipment. Criteria for selection and decision models. Laboratory required. Corequisite: INEG 4540L. Prerequisite: INEG 3413, INEG 3713 and INEG 4523.

**INEG4540L Materials Handling Laboratory (FA, SP)** Corequisite: INEG 4543.

**INEG4553 Production Planning and Control (SP)** Operational problems of production systems including a control of purchased materials inventory; scheduling a job shop, batch, and continuous production processes for single and multi-item product lines; planning of work force and inventory under seasonal and stochastic demand. Prerequisite: INEG 3613.

**INEG4563 Application of Robotics (FA)** Industrial robotics, programming and applications; tooling and interfacing with peripheral equipment, sensor technology, machine vision; application analysis, selection, and justification; research, economics, human interface. Laboratory required. Corequisite: INEG 4560L. Prerequisite: senior standing.

**INEG4560L Application of Robotics Laboratory (FA)** Corequisite: INEG 4563.

**INEG4623 Introduction to Simulation (FA)** Elementary queuing models derivations and applications. Discrete simulation techniques. The SIMNET simulation language. Applications of simulation to the design of industrial and service installations. Simulation project. Prerequisite: INEG 3313 and Computer Elective II.

**INEG4633 Transportation Logistics (SP)** Descriptive and analytical treatment of the critical design and modeling issues of the key transportation functions within the logistics system. Focus is on the storage and movement aspects of logistics in a firm.

**INEG4723 Ergonomics (FA, SP)** The capabilities and limitations of humans are addressed in the context of the person's interaction with machines and the environment. Topics of discussion include anthropometric considerations in equipment design, human sensory and physiological capabilities in the work environment, selection and training of workers, and the design of controls and displays. Corequisite: INEG 4720L. Prerequisite: INEG 3713 and INEG 4333.

**INEG4720L Ergonomics Laboratory (FA, SP)** Corequisite: INEG 4723.

**INEG4733 Industrial Ergonomics (IR)** Gives background and experience in measurement and evaluation of human performance as it pertains to the working environment. The physical, physiological and psychological capabilities of the tasks they are to perform. Laboratory projects required. Prerequisite: INEG 4723 and INEG 4333.

**INEG4904 Industrial Engineering Design (FA, SP)** Comprehensive design problem for an industrial enterprise; integration of preceding courses through development of physical systems and organizational characteristics, financial aspects, product analysis, equipment selection, production layout, distribution systems, and overall economic analysis. Prerequisite: INEG 4543 and INEG 4623.

**INEG5111 Industrial Engineering Graduate Seminar (FA, SP)** Papers presented by candidates for graduate degree in industrial engineering, graduate faculty, and guest lectures on design problems or new developments in the field of industrial engineering.

**INEG5123 Industrial Engineering in the Service Sector (IR)** Review of the development of industrial engineering into the service sector, e.g., health care systems, banking, municipal services, utilities, and postal service. Emphasizes those principles and methodologies applicable to the solutions of problems within the service industries. (Same as OMG 5133) Prerequisite: graduate standing.

**INEG513V Master's Research Project and Report (1-6) (FA, SP, SU)** Required course for students electing the report option.

**INEG514V Research and Special Topics (1-6) (FA, SP, SU)** Fundamental and applied research. Prerequisite: graduate standing.

**INEG5223 Safety and Health Standards Research (IR)** For graduate students who seek Certified Professional or Certified Industrial Hygienist status, or both. Includes review and development of computer databases for standards, interpretations, court decisions, and field memoranda. Test equipment and procedures for determining indoor industrial air containment PEL concentrations and industrial environment noise levels are examined. (Same as OMG 5223) Prerequisite: INEG 4223 or OMG 4303.

**INEG5313 Engineering Applications of Probability Theory and Stochastic Processes (IR)** Basic probability theory; random variables and stochastic processes; distribution of sums, products, and quotients of random variables, with application to engineering; normal and



Poisson processes; engineering applications of Markov chains, ergodic theorem, and applications. Prerequisite: INEG 3313 and MATH 2574.

**INEG5323 Reliability (IR)** Reliability and maintenance techniques including probability modeling, statistical analysis, testing and improvement. Emphasis on engineering applications and computer analysis methods. Prerequisite: INEG 3313 or equivalent.

**INEG5333 Design of Industrial Experiments (SP)** Statistical analysis as applied to problems and experiments in engineering and industrial research; experiment design and analysis; probability; response surface analysis. Prerequisite: INEG 4333 or equivalent.

**INEG5343 Advanced Quality Control Methods (IR)** Acceptance sampling by attributes; single, double, sequential, and multiple sampling plans, sampling plans, sampling plans of Department of Defense; acceptance sampling by variables; Bayesian acceptance sampling; (rectifying inspection for lot-by-lot sampling); control charts; special devices and procedures. Prerequisite: INEG 3313.

**INEG5353 Topical Readings in Quality Control (IR)** Objectives of course: extend the student's quality background into some of the state-of-the-art process control techniques and related current and classical research topics in the area of quality control; vastly increase the student's knowledge of the industrial quality function; identify potential M.S., Ph.D. funded, and publishable research topics. Prerequisite: INEG 5343.

**INEG5423 Engineering in Global Competition (IR)** Studies of principles and cases in engineering administration in global competition. Emphasis on high-technology manufacturing such as the electronics industry. Survey of markets, technologies, multinational corporations, cultures, and customs. Discussions of ethics, professionalism, difference valuing, human relations skills, and other topics relevant to global engineering practice.

**INEG5433 Cost Estimation Models (FA, Even years)** 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. (Same as OMTG 5433) Prerequisite: INEG 4333.

**INEG5443 Decision Models (FA, Odd years)** Focus on quantitative and qualitative decision models and techniques for technical and managerial problems. Emphasis on application and interpretation of results. Topics include decision trees, influence diagrams, weighting methods, value of information, Analytical Hierarchy Process, Bayes Theorem, Monte Carlo simulation, utility theory, risk analysis, group decision making and expert systems. Prerequisite: INEG 3413.

**INEG5513 Advanced Materials Handling (IR)** Computerized offline planning and on-line control of materials handling systems. Specific topics include programmable controls, graphic simulations, and information systems. Emphasis on projects. Prerequisite: INEG 4543 or graduate standing.

**INEG5523 Topics in Automated Systems (IR)** Current developments in applications of automation to industrial processes. Robots, expert systems, artificial intelligence, natural language interfaces, computer interfaces, vision systems. Prerequisite: INEG 4523.

**INEG5613 Optimization Theory I (FA)** Basic solutions and bases in linear equations, matrix version of simplex tableau, duality and primal dual relationships, complementary slackness, revised simplex, bounded variables, decomposition algorithm parametric linear programming, special linear program, generalized network models. Nonlinear programs solved by LP algorithm. Prerequisite: graduate standing.

**INEG5623 Analysis of Inventory Systems (IR)** 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, continuous review models. Prerequisite: INEG 5313.

**INEG5633 Integer Programming and Combinatorial Analysis (IR)** Gomory's cutting plane algorithms for mixed and pure integer linear problems, Glover-Young primal-feasible algorithms, convergence proofs, branch and bound algorithms, Land-Doig algorithm, Dakin's algorithm, implicit enumeration, Balas zero-one algorithm, binary representation of integer problems, zero-one polynomial programming, the traveling salesman problem, quadratic assignment problem, applications of integer programming. Prerequisite: INEG 5613 and MATH 3404.

**INEG5643 Optimization Theory II (IR)** Classical

optimization theory, Lagrangian and Jacobian methods, Kuhn-Tucker theory and constraint qualification, duality in nonlinear problems; separable programming, quadratic programming, geometric programming, stochastic programming, steepest ascent method, convex combinations method, SUMT, Fibonacci search, golden section method. Prerequisite: INEG 5613.

**INEG5653 Modeling and Analysis of Semiconductor Manufacturing (SP, Even years)** Introduction to front end of semiconductor manufacturing process, wafer processing. Topics include an introduction to wafer processing, factory and equipment capacity modeling, automated material handling, simulation, cost modeling, and production scheduling. Prerequisite: INEG 3313.

**INEG5663 Analysis of Queuing Systems (IR)** Poisson axioms, pure birth and death model, queue disciplines (M/M/1) and (M/M/c) models, machine servicing model, Pollazek-Khinchine formula, priority queues, queues in series. Markovian analysis of (GI/M/K) (M/G/1) models, bulk queues. Reneging, balking, and jockeying phenomena. Transient behavior. Prerequisite: INEG 5313.

**INEG5673 Graphs and Network Theory (IR)** Directed, undirected and bipartite graphs; incidence matrices; shortest route problems; maximal flow and minimal cut theorems, planar graphs; and duality theorem. Applications of networks and graphs to transportation, transshipment, assignment, plant layout, routing, scheduling, and tree problems. Prerequisite: INEG 3613 or INEG 5613.

**INEG5713 Advanced Topics in Human Factors Engineering (IR)** Advanced work in special research topics in man-machine systems. Prerequisite: INEG 4723.

**INEG5723 Advanced Man/Machine System Design (IR)** Continuation of INEG 5713. Prerequisite: INEG 5713.

**INEG5823 Systems Simulation (SU)** Monte Carlo technique, construction of digital simulation models, timekeeping in simulations, design of simulation experiment, statistical verification of results. Includes the use of simulation language such as SIMNET and ARENA. Prerequisite: CSEG 1913 and INEG 3313 (or equivalent).

**INEG5843 Scheduling and Sequencing (FA, Even years)** An introduction to constructive algorithms and various operations research approaches for solving sequencing and scheduling problems. The NP-completeness of most scheduling problems leads to a discussion of computational complexity, the use of heuristic solution methods, and the development of worst case bounds. Prerequisite: INEG 3613 and computer programming proficiency.

**INEG600V Master's Thesis (1-9) (FA, SP, SU)**

**INEG6613 Operations Research Applications (IR)** Investigation of literature case studies; use of mathematical models to solve practical problems; data collection and solution implementation. Students work in teams on actual problems observed in industry and government. Prerequisite: INEG 5613.

**INEG6823 Systems Simulation II (IR)** 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.

**INEG700V Doctoral Dissertation (1-18) (FA, SP, SU)**

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## (ISYS) INFORMATION SYSTEMS

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**ISYS1121L Introduction to Computer Information System Laboratory (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 1121L) Applications of microcomputer systems to information management and analysis utilized in decision making. Extensive hands-on familiarization with text processing, spreadsheets, data base, and analytic models emphasizing the integration of these methodologies in the central business disciplines. Laboratory 2 hours per week.

**ISYS2013 Business Statistics (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 2013) Analyses and interpretations of data for business purposes. Includes measures of central tendency and dispersion, test of hypotheses, correlation, regression and inference. Pre- or Corequisite: MATH 2043. Prerequisite: MATH 2053 or MATH 2053C.

**ISYS2232 Business Information Systems (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 2232) Introduction to business management information systems with emphasis on systems concepts in data processing, management information, decision support, and expert systems used in the management decision making process.

Also includes fundamental concepts and computer terminology for both large and small computer systems, concepts of programming and software, and the effects of these systems on business and society. Prerequisite: ISYS 1121L and (MATH 1203 or higher or MATH ACT score 25 or above or MATH SAT score 580 or above).

**ISYS2263 COBOL Implementation of Management Information Systems (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 2263) Application of Common Business Oriented Language (COBOL) to business data processing and implementation of management information systems. Extensive use of computer systems. Prerequisite: ISYS 2232 and MATH 2053 or MATH 2053C each with a grade of C or better.

**ISYS3133 Statistical Analysis (FA, SP)** (First offered Summer 2002, Formerly CISQ 3133) Intermediate statistical inference for business decision making and research in business. Includes probability theory, tests of hypotheses, sampling and experimental design, multiple regression and non-parametric statistical methods. Prerequisite: ISYS 2013.

**ISYS3253 Business Data Communication (FA)** (First offered Summer 2002, Formerly CISQ 3253) This course is designed to equip the student with the analytical models for organizing data communications and networking requirements as well as the functionality of currently available technology to meet those requirements. The student learns data communications analysis and design from a business-oriented perspective. Prerequisite: INEG 5333.

**ISYS3283 Advanced COBOL and Production Application Systems (FA, SP)** (First offered Summer 2002, Formerly CISQ 3283) COBOL features; subroutines, 3-level tables, interactive programs, internals; production libraries; procedures, load modules, linkage and chaining, utilities; production jobs; multistep, conditional execution, restarts, recovery; file technology: direct, VSAM, data base access; maintenance; requirements, skills, tools, and nature of the work. Prerequisite: ISYS 2263.

**ISYS3293 Systems Analysis and Design (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 3293) Practice and application of one structured analysis methodology; development of structured analysis specification; exposure to other methodologies; quality assurance and walkthroughs; survey of real systems and their components. Prerequisite: ISYS 2263.

**ISYS3333 Information Systems Management (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 3333) Management information systems concepts and characteristics are presented. Emphasis on the determination of decision information requirements for strategic programs and operating management levels. Examples of marketing, personnel, financial systems are used. Decision models, computer graphics, database management, decision support, and expert systems as they relate to MIS and business applications are incorporated. Prerequisite: ISYS 2232.

**ISYS3373 End User Computing (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 3373) A computer applications course providing the tools necessary for manipulating, sharing, and presenting data to support business decision making. Topical coverage includes multiple applications linking, presentation graphics, data analysis, interoffice communications, and group decision support systems. Prerequisite: ISYS 3333.

**ISYS3393 Business Application Development in the Visual Basic Environment (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 3393) Principles of design and development of windows and web applications using cutting edge visual development tools included in Visual Studio. The programming language will be Visual Basic and its use in Windows applications and in conjunction with active server pages and XML for web applications. Prerequisite: ISYS 2232.

**ISYS3413 Quantitative Managerial Methods I (SP)** (First offered Summer 2002, Formerly CISQ 3413) Practical applications of mathematical models for managerial decisions. Basis of optimization decisions; linear and integer programming; transportation, inventory, other methods. Prerequisite: ISYS 2013.

**ISYS3533 Developing Multimedia Applications (FA, SP)** (First offered Summer 2002, Formerly CISQ 3533) Designed for students to learn and use the major technology features of multimedia including data, audio, and video. Focuses on using an authoring system to develop business applications such as training, product promotion, reference, information kiosks, and desktop presentations. Prerequisite: ISYS 3333.

**ISYS3603 Production and Operations Management (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 3603) Provides a broad conceptual framework for the management of production and operations processes in



organizations. views total operations within the environmental context and emphasizes quantitative tools for problem identification, analysis of alternatives, quality and the decision making process, enabling organizations to achieve their goals. Prerequisite: ISYS 2013 and ISYS 2232 and ECON 2023.

**ISYS4003H Isysa Honors Colloquium (IR)** (First offered Summer 2002, Formerly CISQ 4003H) Explores events, concepts and/or new developments in the field of Computer Information Systems and Quantitative Analysis. Prerequisite: Senior standing.

**ISYS4243 Current Topics in Computer Information (FA, SP, SU)** (First offered Summer 2002, Formerly CISQ 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. Prerequisite: ISYS 3333.

**ISYS4253 Business Systems Simulation (SP)** (First offered Summer 2002, Formerly CISQ 4253) System simulation techniques; their applications to business systems using an appropriate simulation language; extensive use of computer. Prerequisite: ISYS 3333.

**ISYS4283 Centralized Data Systems (FA, SP)** Introduces student to centralized information system design and implementation for business applications. In-depth study of logical systems modeling; physical file management; and software requirements. Prerequisite: ISYS 2263 and ISYS 3293.

**ISYS4333 Object-Oriented Technologies Seminar (SP)** (First offered Summer 2002, Formerly CISQ 4333) Provides the student with theory and application of information systems development utilizing object-oriented (OO) technology. Topics include: object-oriented—analysis, design, data modeling, database management systems, and programming. Prerequisite: ISYS 3293.

**ISYS4363 Business Application System Development (FA, SP)** (First offered Summer 2002, Formerly CISQ 4363) Review of fundamentals of application processing systems design and development, implementation of such a system by class. Prerequisite: ISYS 3393 and ISYS 4283.

**ISYS4373 Object-Oriented Programming for Business Applications (FA)** (First offered Summer 2002, Formerly CISQ 4373) This course covers object-oriented programming concepts and illustrates them via and 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. Prerequisite: ISYS 2263 or (CSCE 1023 and CSCE 1021L).

**ISYS4423 Quantitative Managerial Methods II (IR)** (First offered Summer 2002, Formerly CISQ 4423) Further topics in linear and integer programming; introduction to nonlinear and dynamic programming; problems in queuing techniques. Prerequisite: ISYS 2013.

**ISYS450V Independent Study (1-3) (FA, SP)** Permits students on individual basis to explore selected topics in data processing and/or Quantitative Analysis.

**ISYS5103 Business Statistics (FA, SP)** (First offered Summer 2002, Formerly CISQ 5103) Analysis, summarization, and interpretation of data for use in managerial decision making. Includes descriptive statistics, probability and probability distributions, sampling, test of hypotheses, analysis of variance, and regression. Prerequisite: MATH 2043 and MATH 2053 or MATH 2053C.

**ISYS5203 Statistics and Quantitative Analysis (FA)** (First offered Summer 2002, Formerly CISQ 5203) Statistical analysis at intermediate level; lectures and problems develop understanding of statistical methods and provide illustrative situations for applying those methods. Includes analysis of variance and multiple regression. Prerequisite: ISYS 3033.

**ISYS5333 Operations Management (IR)** Functions and quantitative techniques involved in the operating areas of a business. An enterprise is viewed as integrated system to demonstrate interrelation of functions and use of feedback, control; current research and special problems supplement text. Prerequisite: ISYS 5103.

**ISYS535V Information Technology Internship Experience (1-3) (FA, SP, SU)** This course allows a student to experience an internship within a business and benefit from the applied IT experience. The internship must focus on IT applications/problems and be supervised by a faculty member as well as a member of the firm. The course may be taken for 1-3 credits and may be repeated for a total

maximum of 3 credit hours. MIS Director approval is required. May be repeated for 3 hours. Pre- or corequisite: MIS Director approval is required.

**ISYS5423 Seminar in Systems Development (IR)** (First offered Summer 2002, Formerly CISQ 5423) 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 3293.

**ISYS5503 Decision Support Systems (FA)** (First offered Summer 2002, Formerly CISQ 5503) An analysis of the highest level of information support that serves the manager-user. A study of systems providing quantitative-based information derived from one or more databases within and/or external to the organization and used to aid upper-level management in the decision making process. The evaluation and application of tools in problem solving and decision making. Prerequisite: ISYS 2263 and ISYS 3333.

**ISYS5613 Business Applications of Nonparametric Techniques (SP)** (First offered Summer 2002, Formerly CISQ 5613) Consideration of business and economic research related to sampling and experimental design, testing of hypothesis, and using nonparametric tests. Prerequisite: ISYS 5203 or equivalent.

**ISYS5623 Statistical Analysis (SP)** (First offered Summer 2002, Formerly CISQ 5623) Applications of statistical techniques and analysis of business and economic research. For students in business and economics without regard to fields of specialization. Prerequisite: ISYS 5203.

**ISYS5713 Seminar in Telecommunications (FA)** (First offered Summer 2002, Formerly CISQ 5713) General telecommunications characteristics and capabilities relative to business applications, networking, electronic commerce, consideration of IT management, security, and ethics. Prerequisite: ISYS 3333.

**ISYS5723 Computer Methods in Research (SU)** (First offered Summer 2002, Formerly CISQ 5723) Applications of computers to business and industrial research. Numerical problem-solving techniques, statistical computational techniques and packages, accessing of government and private standard data bases. Prerequisite: ISYS 5623.

**ISYS5733 Advanced Business System Modeling (IR)** (First offered Summer 2002, Formerly CISQ 5733) Analysis and modeling of business systems using simulation techniques. Modeling of business systems using an appropriate simulation language; extensive use of computer. Prerequisite: ISYS 2263 and ISYS 3333.

**ISYS5833 Data Management Systems (IR)** (First offered Summer 2002, Formerly CISQ 5833) Investigation and application of advanced database concepts include database administration, database technology, selection and acquisition of database management systems. Data modeling and system development in a database environment. Prerequisite: ISYS 5423 and ISYS 2263.

**ISYS5933 Global Information Systems Seminar (IR)** (First Offered Summer 2002, Formerly CISQ 5933) This course is designed to provide an updated, comprehensive and rigorous treatment of the emerging global IT fields. It summarizes current experiences, offers managerial insights, and incorporates foundational perspectives and examines significant issues from global perspectives. Prerequisite: graduate standing.

**ISYS5943 Management of Information Technology Seminar (SP)** (First offered Summer 2002, Formerly CISQ 5943) 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.

**ISYS6001 Research Seminar in DSS (IR)** An examination of research topics in decision support systems (DSS). Emphasis on understanding and conducting DSS research. Pre- or Corequisite: ISYS 5503.

**ISYS6011 Graduate Colloquium (FA, SP)** Presentation and critique of research papers and proposals.

**ISYS6021 Research Seminar in Systems Development (IR)** An examination of research topics in system development. Emphasis on understanding and conducting systems development research. Pre- or Corequisite: ISYS 5423.

**ISYS6031 Research Seminar in Data Management (IR)** An examination of research topics in data management. Emphasis on understanding and conducting data management research. Pre- or Corequisite: ISYS 5833.

**ISYS6103 Seminar in Management Information Systems (IR)** Focuses on the relationship between an information system and the organization it supports. Topics include system theory, information system resources, types of information systems, and characteristics of the managerial activities that involve information systems. Prerequisite: ISYS 5723.

**ISYS6113 Seminar in Computer Information Systems (IR)** Provides the student with information in current CIS technological topics. Topics include end-user computing and development, advanced generation languages, artificial intelligence, human factors, small business computing, data center management, distributed data processing and communications, and technology. Prerequisite: ISYS 6103.

**ISYS6123 Seminar in Computer Information Systems Research (IR)** This directed special problems seminar provides a forum to study research in CIS. In addition, students design and develop plans of research in light of current topics and methodology. Research topics in CIS. Prerequisite: ISYS 5423 and ISYS 5503 and ISYS 5833 and ISYS 6113.

**ISYS6333 Research Seminar (FA, SP)** Topical research seminar; emphasizes on understanding and conducting information systems research. Topics will vary. May be repeated for 18 hours.

**ISYS636V Special Problems (1-6) (IR)** Independent reading and research under supervision of senior staff member.

**ISYS6423 Seminar in Causal Modeling (SP)** Exposure to use of causal modeling in current research. Particular emphasis given to confirmatory factor analysis, covariance structure modeling, and their applications in construct measurement and hypothesis testing. (Same as MKTT 6423)

**ISYS700V Doctoral Dissertations (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (ITAL) ITALIAN

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**ITAL1003 Elementary Italian I (FA)**

**ITAL1013 Elementary Italian II (SP)** Elementary courses stress correct pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: ITAL 1003 or equivalent.

**ITAL2003 Intermediate Italian I (FA)** Intermediate courses lead to greater facility in spoken language and to more advanced reading skills. Prerequisite: ITAL 1013 or equivalent.

**ITAL2013 Intermediate Italian II (SP)** Continued development of basic speaking comprehension, and writing skills and intensive development of reading skills. Prerequisite: ITAL 2003 or equivalent.

**ITAL3003 Italian Conversation (FA)** Prerequisite: ITAL 2013.

**ITAL3013 Introduction to Literature (SP)** Development of reading skills and introduction to literary analysis. Prerequisite: ITAL 2013 or equivalent.

**ITAL475V Special Investigations (1-6) (IR)** May be repeated for 6 hours.

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## (ITED) INDUSTRIAL/ TECHNICAL EDUCATION

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**ITED1203 Drafting Technology I (FA)** Use and care of instruments; lettering, sketching, applied geometry, pictorial drawing, and orthographic projection. Introduction to computer-aided drafting. Corequisite: ITED 1201L.

**ITED1201L Drafting Technology I Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of drafting technology I. Corequisite: ITED 1203.

**ITED1303 Construction Methods and Materials (FA, SP, SU)** Primary objective is to acquaint the student with various types of construction materials and their application. Corequisite: ITED 1301L.

**ITED1301L Construction Methods and Materials Laboratory** Laboratory exercises in principles and practices of construction methods and materials. Corequisite: ITED 1303.

**ITED1403 Power and Energy (FA, SP, SU)** How energy is extracted, processed, converted, and used to power societal needs. Corequisite: ITED 1401L.

**ITED1401L Power and Energy Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of power and energy. Corequisite: ITED 1403.

**ITED1413 Principles of Electricity (FA, SP, SU)** Principles of electricity; theory and practice in project design and construction.

**ITED1411L Principles of Electricity Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of electricity.

**ITED1503 Introduction to Industrial and Technical Education (FA, SP, SU)** Surveying and interpreting the origin, principles, and objectives of industrial and technical education and its relationship to other educational programs. Required for all undergraduates in industrial/technical education.

**ITED1603 Industrial Safety I (FA, SP, SU)** Study of accidents, causes, the cost of accidents, appraising safety performance, safety inspection, planning and maintaining a safe environment, and organization and operation of school laboratories and industrial accident prevention programs.

**ITED2213 Industrial Design (FA, SP, SU)** Principles of structural design; contour and surface ornamentation applied to 3-dimensional objects; sketches, details, and working drawings of projects. Corequisite: ITED 2211L.

**ITED2211L Industrial Design Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of industrial design. Corequisite: ITED 2213.

**ITED2313 Metals Fabrication (FA, SP, SU)** A study of the tools, materials, and processes involved in sheet metal, ornamental iron work, welding, and forging used to install metal products either in the fabrication shop or on the construction site. Corequisite: ITED 2311L.

**ITED2311L Metals Fabrication Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of metals fabrication. Corequisite: ITED 2313.

**ITED2423 Industrial Maintenance (FA, SP, SU)** The principles and practices used in installing, maintaining, troubleshooting, diagnosing, and repairing electrical, mechanical, and facility components found in the manufacturing, construction, and service industries. Corequisite: ITED 2421L.

**ITED2421L Industrial Maintenance Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of industrial maintenance. Corequisite: ITED 2423.

**ITED2613 Machine Tool Manufacturing (FA, SP, SU)** Chip removal methods of machining common commercial metals. Emphasis upon machining processes on lathe, shaper, drill press, grinders, and milling machines. Corequisite: ITED 2611L.

**ITED2611L Machine Tool Manufacturing Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of machine tool manufacturing. Corequisite: ITED 2613.

**ITED3223 Drafting Technology II (FA, SP, SU)** Combination of drafting and design including section views, threaded fasteners, and dimensioning working drawings combined with rendering of plans and specifications for houses of traditional and contemporary design; emphasis on computer-aided drafting and design. Corequisite: ITED 3221L.

**ITED3221L Drafting Technology II Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of drafting technology II. Corequisite: ITED 3223.

**ITED3323 Construction Coating Applications (FA, SP, SU)** Use and application of various transparent and opaque finishes that are applied by brush, spray and wipe-on methods, including finishes for wood, metal, and concrete. Corequisite: ITED 3321L.

**ITED3321L Construction Coating Application Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of construction coating applications. Corequisite: ITED 3323.

**ITED3433 Exploring Electronics Technology (FA, SP, SU)** Vacuum tubes, gas tubes, and semiconductors; electronic circuits including amplifier, oscillators, switching and timing circuits; applications including sound and video system, relays, controls, and industrial devices. Corequisite: ITED 3431L.

**ITED3431L Exploring Electronics Technology Laboratory (FA, SP, SU)** Corequisite: ITED 3433.

**ITED3513 Applied Technology Education (FA, SP, SU)** An introductory course in technology education focusing on the management of hands-on activities utilized in technology programs; for elementary and secondary industrial technology teachers.

**ITED3623 Wood Processing Technology (FA, SP, SU)** Basic principles of design and construction processes using machines, materials, and supplies incorporated in machine wood processing technology. Corequisite: ITED 3621L.

**ITED3621L Wood Processing Technology Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of wood processing technology. Corequisite: ITED 3623.

**ITED3633 Plastics in Industry (FA, SP, SU)** Tools, materials, and processes involved in the use and fabrication of plastics relating to modern plastic industries. Corequisite: ITED 3631L.

**ITED3631L Plastics in Industry Laboratory (FA, SP, SU)** Laboratory exercises in principles and practices of plastics in industry. Corequisite: ITED 3633.

**ITED4523 Advanced Technology Education (FA, SP, SU)** Provides the student with the expertise to develop and update a typical industrial technology education program to keep the program current with changes that occur in technology.

**ITED459V Industrial Internship (1-12) (FA, SP, SU)** In an actual industrial setting, the student will study managerial functions, organizational practices, product design, production fabrication, routing, quality control, work schedules, industrial relations, and related activities of American industrial society. May be repeated for 15 hours.

**ITED4643 Industrial Safety II (FA, SP, SU)** In-depth study of accidents, causes, the cost of accidents, appraising safety performance, safety inspection, planning and maintaining a safe environment, and organization and administration of school laboratory and industrial accident prevention program.

## (JAPN) JAPANESE

**JAPN1003 Elementary Japanese I (FA)**

**JAPN1013 Elementary Japanese II (SP)** Elementary courses stress correct pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: JAPN 1003 or equivalent.

**JAPN2003 Intermediate Japanese I (FA)** Intermediate courses lead to greater facility in spoken language and to more advanced reading skills. Prerequisite: JAPN 1013 or equivalent.

**JAPN2013 Intermediate Japanese II (SP)** Continued development of basic reading comprehension and writing skills and intensive development of reading skills. Prerequisite: JAPN 2003 or equivalent.

**JAPN2022 Intermediate Conversation I (FA, SP)** Supplemental to 2003. Provides 2 hours of guided conversation per week with the objective of building the listening/speaking skills.

**JAPN2032 Intermediate Conversation II (FA, SP)** Supplemental to 2013. Provides 2 hours of guided conversation per week with the objective of building the listening/speaking skills.

**JAPN3003 Advanced Japanese I (FA)** Introduces more complex forms and structures of the language as well as more Kanji (Chinese Characters) aiming at the improvement of all the skills: speaking, listening, writing and reading. Prerequisite: JAPN 2013.

**JAPN3013 Advanced Japanese II (SP)** Continuation of JAPN 3003 with more complex forms and structures of the language as well as more Kanji (Chinese Characters) aiming at the improvement of all the skills: speaking, listening, writing and reading. Prerequisite: JAPN 3003.

**JAPN3033 Advanced Japanese Conversation (FA)** Conversational practice for advanced learners of Japanese. Designed primarily for students who intend to use Japanese in business and other formal settings. Honorific and humble expressions will be emphasized. Prerequisite: JAPN 2013.

**JAPN3983 Special Studies (IR)** May be offered in a subject not specifically covered by courses otherwise listed. May be repeated for 6 hours.

**JAPN4213 Japanese Culture (IR)** Insight into Japanese civilization and culture with special emphasis on the areas such as social life and environment, education, religion and customs, and visual and performing arts. This course also discusses western influence on Japanese society, culture and language and how traditional and modern values are manifested in Japanese society. May be repeated for 6 hours. Prerequisite: JAPN 2013.

**JAPN4313 Language and Society of Japan (FA)**

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. Prerequisite: junior standing.

## (JOUR) JOURNALISM

**JOUR1023 Media and Society (FA, SP)** A survey of mass media (newspaper, radio, TV, magazine, advertising, public relations, photography, etc.) that stresses their importance in today's society and introduces the student to the various areas in journalism. Recommended for students considering journalism as a major.

**JOUR1033 Fundamentals of Journalism (FA, SP, SU)** Introduces students to the skills of observation, critical thinking and concise writing required in all aspects of journalism, as well as to the technology needed in upper-level courses. Practice using references for grammar and journalistic style. A prerequisite to JOUR 2013, 2033, 2063 and 4143. Corequisite: JOUR 1030 L.

**JOUR1030L Fundamentals of Journalism Laboratory (FA, SP, SU)**

**JOUR2013 News Reporting I (FA, SP)** Intensive training in the methods of gathering and writing news. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: JOUR 1023 and JOUR 1033.

**JOUR2032 Broadcast News Reporting I (FA, SP)** Intensive training in the methods of gathering and writing broadcast news. Lecture 2 hours per week. Corequisite: JOUR 2031L. Prerequisite: JOUR 1033.

**JOUR2031L Broadcast News Reporting I Laboratory (FA, SP)** Provides experience in basic broadcast news reporting techniques. Laboratory 3 hours per week. Corequisite: JOUR 2032. Prerequisite: JOUR 1033.

**JOUR2063 Media Technology (FA, SP)** Introduction to computer skills required in journalism; focus is training in the major computer software used in the profession. Prerequisite: JOUR 1023 and JOUR 1033.

**JOUR2332 Photojournalism I (FA, SP)** Beginning course in the fundamentals of photography, including darkroom procedures, composition, and the use of cameras. Lecture 2 hours per week. Corequisite: JOUR 2331L.

**JOUR2331L Photojournalism I Laboratory (FA, SP)** Provides experience in photography lab techniques. Laboratory facilities are supplied. Laboratory 2 hours per week. Corequisite: JOUR 2332.

**JOUR3002 Graphics of Journalism (FA, SP)** Principles of typography, including elementary printing, makeup, type faces, design, and proofreading. Lecture 2 hours per week. Corequisite: JOUR 3001L.

**JOUR3001L Graphics of Journalism Laboratory (FA, SP)** Hands-on training and experience in graphics design and production techniques. Laboratory 2 hours per week. Corequisite: JOUR 3002.

**JOUR3013 Editing (FA, SP)** Theories and practices in newspaper editing, copyreading, headline writing, page layout and the gathering and publication of written and pictorial information. Prerequisite: JOUR 1023 and JOUR 2013.

**JOUR3023 News Reporting II (FA, SP, SU)** Continuation of JOUR 2013. Lecture 2 hours, laboratory 2 hours per week. Corequisite: JOUR 3020L. Prerequisite: JOUR 2013.

**JOUR3020L News Reporting II Laboratory (FA, SP, SU)** Corequisite: JOUR 3023.

**JOUR3062 Newspaper Graphics (FA, SP, SU)** Principles and methods of newspaper design and production, including typography, illustrations, copy processing, layout, and pasteup. Lecture 2 hours per week. Corequisite: JOUR 3061L.

**JOUR3061L Newspaper Graphics Laboratory (FA, SP, SU)** Hands-on practice in techniques of newspaper design and production. Laboratory 2 hours per week. Corequisite: JOUR 3062.

**JOUR3072 Broadcast News Reporting II (FA, SP)** Advanced techniques in broadcast journalism including: covering beats; writing and interviewing; and producing news program for television. Corequisite: JOUR 3071L. Prerequisite: JOUR 2032 and JOUR 2031L.

**JOUR3071 Newspaper Graphics Laboratory (FA, SP, SU)**



**JOUR3071L Broadcast News Reporting II**

**Laboratory** (FA, SP) Television studio production including producing, directing, teleprompter, character generation, audio, lighting, and camera operation. Produce weekly TV news program for broadcast. Corequisite: JOUR 3072. Prerequisite: JOUR 2032 and JOUR 2031L.

**JOUR3083 Photojournalism II** (FA, SP, SU) Study of news and feature photography. Includes planning and shooting photographs for newspapers and magazines, photojournalistic techniques, and other aspects of photographing for publication. Lecture 3 hours, laboratory 2 hours per week. Corequisite: JOUR 3080L. Prerequisite: JOUR 2332 and JOUR 2331L.

**JOUR3080L Photojournalism II Laboratory** (FA, SP, SU) Corequisite: JOUR 3083.

**JOUR3093 Web Design for Journalism, Advertising & Public Relations** (SP) Course covers basic UNIX and HTML, and leading web design software. Major focus is on journalistic informational and commercial sites; minor focus on personal pages. Prerequisite: JOUR 2063.

**JOUR3123 Feature Writing** (FA, SP, SU) Study of non-fiction newspaper and magazine feature articles with emphasis on locating subjects, and on writing techniques and practice in article writing. Prerequisite: JOUR 2013.

**JOUR3133 Editorial Writing** (FA, SP, SU) Study of the opinion function of the news media. Includes editorial writing, the newspaper editorial/opinion columns, letters from readers, and broadcast commentary. Prerequisite: JOUR 2013 (or JOUR 2032) and junior standing.

**JOUR3163 Sports Journalism** (FA) Emphasis on techniques and principles of coverage of sports and sports-related subjects on and off the field, and on the relationship between sports and the mass media.

**JOUR3333 Ethics in Journalism** (SP) Critical examination of specific ethical problems confronting professionals in all areas of mass communications. Reading and writing assignments are aimed at familiarizing students with the nature of the mass media and their social responsibilities. Prerequisite: junior standing.

**JOUR3633 Media Law** (FA, SP) Constitutional guarantees, statutory laws and court cases applicable to mass communications. Prerequisite: junior standing.

**JOUR3723 Advertising Principles** (FA, SP) Introductory course to the broad field of advertising. The course includes a study of the role of advertising in modern society with emphasis being given to the extent and manner of use of advertising in newspapers, magazines, radio, television, and other media. Prerequisite: junior standing.

**JOUR3743 Public Relations Principles** (FA, SP) Study of theory, methods, and ethics of public relations in modern society, business, and communications. Influencing opinion through acceptable performance and 2-way communication. Recommended for students in many fields. Prerequisite: junior standing.

**JOUR3923H Honors Colloquium** (FA, SP, SU) Covers a special topic or issue, offered as a part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in journalism).

**JOUR401V Advanced Journalistic Practices (1-4)** (FA, SP) Study of advanced journalistic practices and methods, individual or group projects. Prerequisite: junior standing and 10 hours of journalism and a 2.5 cumulative grade average.

**JOUR402V Internship in Journalism (1-3)** (FA, SP, SU) Credit for practical experience gained through a journalistic internship. Report required on significant aspect of internship experience. May be repeated for 3 hours. Prerequisite: JOUR major and junior standing and 10 hours JOUR and 2.50 cumulative grade point average.

**JOUR4043 Government and the Media** (FA, SP, SU) Focuses on the links between mass media and government and the increasingly significant role of media in politics and government. Examines the power, responsibility, and performance of the press and public officials/government agencies in their relationship with each other. Prerequisite: junior standing.

**JOUR405V Specialized Journalism Seminar (1-3)** (IR) Primary purpose of course is to enlarge the journalistic skills of students interested in advanced forms of mass communication. Students undertake projects related to particular aspects or problems of journalism. Content varies. May be repeated twice for a maximum of 6 hours credit, as content will vary. May be repeated for 6 hours.

**JOUR4063 Computer-Assisted Publishing** (FA, SP, SU) 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. Prerequisite: JOUR 3002.

**JOUR4143 Public Relations Writing** (FA, SP) Instructional and writing practice to develop the professional-level writing skills required of public relations practitioners. Emphasizes different approaches required for different audiences and media. Prerequisite: JOUR 1033 and a grade of B or better in both JOUR 3723 and JOUR 3743.

**JOUR4233 School Publications** (FA, SP, SU) Primarily for students intending to teach journalism or to supervise publications in high schools. Prerequisite: advanced standing.

**JOUR4413 Broadcast Advertising and Sales** (FA) The creation of advertising campaigns for the broadcast media and techniques involved in the presentation of these campaigns to prospective media buyers. Emphasis is also placed on the gathering and use of rating systems for broadcasting. Prerequisite: JOUR 3723.

**JOUR4423 Creative Strategy and Execution** (FA, SP) The creation of advertising copy and layout for the mass media with emphasis on strategy, the written message, and the physical appearance for the advertisement. Includes laboratory component. Prerequisite: A grade of B or better in both JOUR 3723 and JOUR 3743.

**JOUR4453 Media Planning and Strategy** (FA) Includes the study of media characteristics, market research, media strategies, media analysis, media-market measurements, and the development of media plans. Emphasis is placed on the analysis of major mass media strategies, tactics, and planning. Prerequisite: A grade of B or better in both JOUR 3723 and JOUR 3743.

**JOUR4463 Campaigns** (FA, SP, SU) 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. Prerequisite: JOUR 3723 and JOUR 3743 and JOUR 4423 and JOUR 4453.

**JOUR4503 Advanced Feature Writing** (FA) This course is designed for students with proven feature writing skills and basic training, to write a magazine-length, non-fiction, publishable-quality story on a timely subject that has connections to northwest Arkansas. Stories will be published in a student-managed forum. Prerequisite: JOUR 3123.

**JOUR4553 Magazine Editing and Production I** (FA, SP, SU) Instruction with lab work in editing and producing various types of magazines. Course includes magazine design, selecting and editing stories and photographs, laying out the story and photo pages, and other mechanical processes. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: JOUR 3053.

**JOUR4863 Television News Reporting I** (FA, SP) Includes the specialized knowledge and skills needed in field reporting, anchoring, writing, and producing news for commercial television. Also incorporates videography, tape editing. Lab component arranged. Corequisite: JOUR 4860L. Prerequisite: JOUR 3072 and JOUR 3071L.

**JOUR4860L Television News Reporting I Laboratory** (FA, SP) Corequisite: JOUR 4863.

**JOUR4873 Television News Reporting II** (FA, SP) Continuation of JOUR 4863. Laboratory component arranged. Prerequisite: JOUR 4863.

**JOUR4883 Advanced Television News Production** (FA, SP) Continuation of JOUR 4873. Students prepare and present television newscasts for air. Laboratory component arranged. Corequisite: JOUR 4880L. Prerequisite: JOUR 4873.

**JOUR4880L Advanced Television News Production Laboratory** (FA, SP) Corequisite: JOUR 4883.

**JOUR4903 Community Newspaper** (SP) 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. Prerequisite: junior standing.

**JOUR498V Journalism Writing Requirement (1-6)** (FA, SP, SU)

**JOUR498VH Honors Journalism Writing Requirement (1-6)** (FA, SP, SU)

**JOUR5003 Advanced Reporting** (FA, SP, SU) Stresses public affairs coverage, interpretive, investigative, and analytic journalism, involving research, work with documents, public records, and budgets and specialized reporting.

**JOUR5033 Critical and Opinion Writing and**

**Commentary** (FA, SP, SU) Experience in writing and analyzing columns, editorials, criticism, and other forms of opinion and commentary in the media and in examining the media's role as a forum for opinion and commentary and its impact and influence.

**JOUR5043 Research Methods in Journalism** (FA, SP, SU) 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.

**JOUR5063 Issues in Advertising and Public Relations** (FA) 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.

**JOUR5073 Propaganda and Public Opinion** (FA, SP, SU) Examines and analyzes the means of influencing and measuring public opinion, with an emphasis on survey research and polling.

**JOUR5183 International Mass Communications** (FA, SP, SU) Examination of national media systems, issues in international communications, the role of the media in coverage of international affairs, and the impact of new technologies on mass communications.

**JOUR5193 Professional Journalism Seminar (IR)** 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. May be repeated twice for a maximum of 6 hours credit, as content will vary. May be repeated for 6 hours.

**JOUR5233 Media and Public Policy** (FA, SP, SU) Focuses on the interaction between media, politics, government, and public policy, particularly on the impact and influence of the media on the public policy agenda.

**JOUR5313 Literature of Journalism** (FA, SP, SU) A study of superior works of non-fiction journalism, past and present. Includes authors from Daniel Defoe to John McPhee.

**JOUR5323 Documentary Production I** (FA) 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.

**JOUR5333 Documentary Production II** (SP) A continuation of JOUR 5323, Documentary Production I. Students photograph, write, and edit a documentary begun in the fall semester. Prerequisite: JOUR 5323.

**JOUR600V Master's Thesis (1-6)** (FA, SP, SU) Required of all M.A. journalism students.

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## (KINS) KINESIOLOGY

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**KINS1013 Careers in Kinesiology: A History and an Overview** (FA, SP, SU) An introduction to the broad field of Kinesiology, including historical aspects and career perspectives.

**KINS2223 Motor Development** (FA, SP) An overview of contemporary motor development and movement theory, developmental hierarchies, and physiological aspects of development throughout the lifespan.

**KINS2393 Prevention and Care of Athletic Injuries** (FA, SP) Introduction to the prevention and care of athletic related injuries. Includes athletic injury recognition and management. Prerequisite: ZOO 2443 and ZOO 2441L.

**KINS3093 Application Techniques in Athletic Training** (FA, SP, SU) The purpose of this course is to help the student gain new and useful information of applying techniques of athletic injuries through taping and wrapping. Athletic training wrapping and taping techniques can help in the reduction of athletic injuries and proper care once an injury occurs. This course has been designed to integrate personal experiences each student possesses with teaching based practical training for taping and wrapping of the human body. Prerequisite: ZOO 2443 and ZOO 2441L.

**KINS3153 Exercise Physiology** (FA, SP, SU) Examination of effects of exercise on the physiology of the systems of the body. The exploration includes effects during, immediately after, and as long term results of work and exercise. Prerequisite: ZOO 2213 and ZOO 2211L.

**KINS3163 Exercise Physiology: Theory and Application** (FA, SP, SU) Examination of the changes



during childhood and a adolescence of physiological responses to exercise. The exploration includes the study of the maturation of the body's functional capacities as it relates to exercise. Designed for Physical Education Teacher Education majors. Prerequisite: ZOOL 2443 and ZOOL 2441L and KINS 2223; for K-12 physical education majors only.

**KINS3353 Mechanics of Human Movement (FA, SP, SU)** An introduction to basic analysis of motor skills. No credit given toward major in Zoology. (Same as ZOOL 3353) Prerequisite: ZOOL 2443 and ZOOL 2441L.

**KINS3373 Philosophical/Sociocultural Impact on Kinesiology (FA, SP)** An investigation of the philosophical and sociocultural impact on Kinesiology.

**KINS3413 Evaluative Techniques for Athletic Training (FA)** Use of scientific assessment methods to recognize and evaluate the nature and severity of athletic injury. Prerequisite: KINS 2393.

**KINS3533 Laboratory Techniques (FA)** Practical experience in testing physical fitness in both the laboratory and non-laboratory settings. Prerequisite: KINS 3153.

**KINS3663 Rehabilitation of Athletic Injury (FA)** A study of athletic injury rehabilitation principles involving the use of various therapeutic exercise protocols. Provides an opportunity to develop and implement rehabilitation programs. Prerequisite: KINS 2393.

**KINS3703 Measurement Concepts in Kinesiology (FA, SP, SU)** A presentation of basic measurement concepts considered in a generic sense and that inform both applied and theoretical considerations within the several subdisciplines of kinesiology.

**KINS3863 Modalities and Neurology in Athletic Training (SP)** Provides a theoretically based guide to the use of therapeutic modalities for the management of athletic injuries in a practical setting. Prerequisite: KINS 2393.

**KINS405V Independent Study (1-3) (FA, SP, SU)** Provides student an opportunity to pursue special study of research problems. May be repeated for 12 hours.

**KINS4323 Analytical Basis of Movement Science (SP)** Study of the practical applications of biomechanical and physiological principles. Prerequisite: KINS 3153 and KINS 3353.

**KINS4413 Organization, Management, and Marketing Skills for the Kinesiology Professional (FA, SP)** Organizational policies, management principles, and marketing skills for the Kinesiology professional. Prerequisite: senior standing.

**KINS4643 Current Trends and Issues in Athletic Training (SP)** An examination of the athletic training profession and the current trends and issues that are influential in its development. Prerequisite: KINS 2393.

**KINS4733 Senior Seminar (FA, SP, SU)** This capstone class will cover special topics for the Exercise Science students in preparation for entry into the profession. In addition to specific topics, students will prepare their resumes and make a formal presentation. Prerequisite: senior status in Exercise Science.

**KINS4773 Performance and Drugs (SP)** 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. Prerequisite: KINS 3153.

**KINS4833 Exercise Applications for Special Populations (FA, SP, SU)** The study of the effects of exercise, exercise training, and other stressors in special groups. A detailed study of the biomechanical and physiological effects of exercise on the elderly, the diabetic, the post-coronary, and the individual with functional limitations. Prerequisite: KINS 3153 and KINS 3353.

**KINS4903 Internship in Exercise Science (FA, SP)** Provides opportunities for students in Exercise Science to gain experience in clinics, hospitals, fitness centers, athletic training facilities or related settings. Enrollment is limited to students in exercise science having taken KINS 3353 and KINS 3533. May be repeated for 12 hours.

**KINS5212 Athletic Training Clinical I - Application of Athletic Preventive Devices (SU, Odd years)** 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. Prerequisite: admission to the graduate program in athletic training.

**KINS5222 Athletic Training Clinical II - Evaluation Lab - Upper Extremity (FA, Even years)** 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 extremity, trunk and head. Prerequisite: KINS 5212.

**KINS5232 Athletic Training Clinical III - Evaluation - Lower Extremity (SP, Even years)** 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 lower extremity. Prerequisite: KINS 5222.

**KINS5242 Athletic Training Clinical IV - Emergency Procedures (SP, Odd years)** 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 emergency procedures. Prerequisite: KINS 5232.

**KINS5252 Athletic Training Clinical V - Modality Lab (SP, Even years)** 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 modalities. Prerequisite: KINS 5242.

**KINS5262 Athletic Training Clinical VI - Rehabilitation Lab (SP, Even years)** 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. Prerequisite: KINS 5252.

**KINS5323 Biomechanics I (FA, SP, SU)** Intended to serve as an introduction to biomechanics and focuses on scientific principles involved in understanding and analyzing human motion.

**KINS5333 Instrumentation in Biomechanics (FA, SP, SU)** The application of knowledge and skills necessary for data collection for sports analysis. Provides valuable information on instrumentation used specifically in biomechanics. Prerequisite: KINS 5323.

**KINS5363 Evaluation Techniques of Athletic Injuries - Upper Extremity (FA, Even years)** 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.

**KINS5373 Evaluation Techniques of Athletic Injuries - Lower Extremity (SP, Even years)** 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.

**KINS5423 Assessment and Prescriptive Programming in Adapted KINS (FA, SU)** Instruction in the assessment, prescription, and use of instruction methods, materials, and equipment relevant to specific handicapping conditions in the adapted physical education setting.

**KINS5443 Perceptual-Motor Development and Clinical Application (FA, SP, SU)** In-depth examination relevant to specific handicapping conditions in the adapted physical education setting.

**KINS5453 Therapeutic Modalities in Athletic Training (SU, Even years)** 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.

**KINS5463 Therapeutic Exercise and Rehabilitation of Athletic Injuries (SU, Even years)** 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.

**KINS5473 Administration in Athletic Training (SU, Odd years)** 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.

**KINS5483 Medical Conditions in Athletic Training (SP, Even years)** 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.

**KINS5493 Practicum in Adapted Physical Education (SP, SU)** Deals with the application of skills, knowledge and concepts necessary for planning, organizing and conducting adapted physical education programs through supervised field experiences.

**KINS5513 Physiology Exercise I (FA, SP, SU)** A study of the foundation literature in exercise physiology. Emphasis is placed on the muscular, cardiovascular, and respiratory systems.

**KINS5523 Muscle Metabolism in Exercise (SP)** A study of the metabolic changes that occur in muscle as a result of exercise, exercise training, and other stressors. Prerequisite: KINS 5513 or equivalent.

**KINS5533 Cardiac Rehabilitation Program (FA, SP, SU)** 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.

**KINS5543 Cardiovascular Function in Exercise (FA, SP, SU)** 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. Prerequisite: KINS 5513 or equivalent.

**KINS5593 Practicum in Laboratory Instrumentation (FA, SP, SU)** Practical experience in testing physical fitness utilizing laboratory equipment. Objective is to quantify physiological parameters, leading to the individualized exercise prescription.

**KINS560V Workshop (1-3) (IR)**

**KINS5643 Motor Learning (FA)** 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.

**KINS574V Internship (1-6) (SP)**

**KINS5753 Research in Sport Psychology (SU)** Investigation of historical and contemporary research in sport psychology. Prerequisite: HKRD 5353.

**KINS5773 Performance and Drugs (SU)** 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. Prerequisite: ZOOL 2213 and ZOOL 2211L or equivalent.

**KINS589V Independent Research (1-3) (FA, SP, SU)** Development, implementation, and completion of basic or applied research project. Prerequisite: M.S. degree program in exercise and movement sciences and HKRD 5353 and EDFD 5393.

**KINS599V Seminar (1-3) (IR)**

**KINS600V Master's Thesis (1-6) (FA, SP, SU)**

**KINS605V Independent Study (1-3) (FA, SP, SU)** Provides students with an opportunity to pursue special study of educational problems.

**KINS6323 Biomechanics II (FA, SU)** Analysis of human movement with emphasis on sports skills by application of principles of anatomy, kinesiology, and cinematographical analysis. Prerequisite: KINS 5323.

**KINS6343 Physiology of Exercise II (SP)** 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.

**KINS660V Workshop (1-3) (IR)**

**KINS674V Internship (1-3) (IR)**

**KINS699V Seminar (1-3) (IR)**

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## (LARC) LANDSCAPE ARCHITECTURE

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### LARC1003 Basic Course in the Arts: Landscape Architecture (FA, SP)

Mankind's changing attitudes toward urban and rural outdoor spaces and their aesthetic and cultural values. The origins of the environmental/conservation movement and the development of an American land ethic. Appreciation of the relationship of the natural and historic landscape to the arts and the aesthetic importance of open space.

### LARC1211 Introduction to Landscape Architecture I (FA, SU)

Interdisciplinary introduction to basic principles of design and the natural landscape. Urbanism and the public realm. Lecture 1 hour per week.

### LARC1221 Introduction to Landscape Architecture II (SP, SU)

Theoretical, formal, and constructive principles and their impact in the design discipline, modernism and after. Introduction to the intellectual and philosophical foundations of landscape architecture. Lecture 1 hour per week. Prerequisite: LARC 1211.

### LARC1315 Landscape Architecture Design I (FA, SU)

Theory and craft of seeing, drawing, and model-building to record and communicate a design. Basic design principles with architectural and natural geometries are introduced and employed. Studio and lecture. Corequisite: LARC 1211.

### LARC1325 Landscape Architecture Design II (SP, SU)

Basic concepts of spatial, visual and experiential analysis are used in the investigation and evaluation of designed landscapes. Introduction to three-dimensional spatial organization systems and supporting principles. Continued drawing exercises and analysis graphics leading to design conceptualization. Studio and lecture. Corequisite: LARC 1221. Prerequisite: LARC 1315 and LARC 1211.

### LARC2113 Design Communications I (FA)

Aimed at visualization of the design process from conception to completion. Provides a means to effectively communicate, evaluate, synthesize and refine ideas. Aimed at teaching various levels of graphics associated with the design process. Communication of ideas through various techniques is explored and the computer is introduced as a graphics tool and as a means of organizing ideas in a creative, yet orderly, fashion.

### LARC2123 Design Communications II (SP)

Continuation of LARC 2113 with a focus on computer technologies in two-dimensional graphic representation and three-dimensional modeling. Course includes an introduction to computer system use and software such as: CAD, GIS, Photoshop, desk-top publishing, Word, and other professional office programs. Studio and lecture.

### LARC2336 Landscape Architecture Design III (FA)

Introduction to design process(es) that responds to site and context. Reinforcement of design principles and organization systems applied to small scale design projects. Studio and lecture. Prerequisite: LARC 1221 and LARC 1325.

### LARC2346 Landscape Architecture Design IV (SP)

(Formerly LARC 3345) Expansion of abilities to analyze existing conditions of site and develop methods for interpreting and synthesizing information and perceptions into spatial design proposals. Emphasis on design form and the use of meaning and landscape narrative applied to increased scale projects within a larger or more complex context. Studio and lecture. Prerequisite: LARC 2336 and LARC 3413.

### LARC2714 Landscape Architecture Construction I (SP)

(Grading) Introduction to landscape architectural construction with an emphasis on grading, earthwork computations, and technical drawing skills. Introduction to roadway alignment, the land survey system, and construction documents. Lecture and laboratory.

### LARC302V Special Studies (1-6) (IR)

Individual or group study and practicum and travel involving landscape design, history, and environmental analysis. May be repeated for 6 hours.

### LARC303V Special Projects (1-6) (IR)

Design implementation, study, practicum, and preparation of working drawings. May be repeated.

### LARC3356 Landscape Architecture Design V (SP)

(Formerly LARC 3355) Investigation of social behavior as applied to program and design that serves human needs. Projects reflect increased scope, scale, and resolution with a detailed design component. Studio and lecture. Prerequisite: LARC 2113, LARC 2346 and LARC 2714; and acceptance into the professional program.

### LARC3366 Landscape Architecture Design VI (SP)

(Formerly LARC 4365) Investigation of ecological determinism, historic and contemporary planning, and

sustainable design as distinct approaches to landscape architecture. Studio and lecture. Prerequisite: LARC 3356.

### LARC3413 History of Landscape Architecture (FA)

Analysis of the interaction between existing landscapes and human cultural development as reflected in the meaning and organization of landscape designs at community and project scales from the neolithic period to the mid-nineteenth century.

### LARC3723 Landscape Construction II (FA)

(Formerly LARC 3724) Design of structure and landscape elements within the existing environment. Introduction to landscape construction details, and other working drawings. Includes laboratory. Prerequisite: LARC 2325.

### LARC3734 Landscape Architecture Construction III (SP)

(Structures) Introduction into the design and fabrication methods of structures in the landscape. Emphasis on statics in calculating sizes and selection of materials for free-standing and retaining walls, and wooden structures. Advanced technical drawing component and computer integration of drawing production. Lecture and laboratory. Prerequisite: LARC 3723.

### LARC3813 Trees and Plants of Zone 7 (IR)

Identification and study of horticultural and structural characteristics of trees, shrubs, vines, and groundcovers in Zone 7 (Wyman). Course may be taught in Garvan Woodland Gardens in Hot Springs.

### LARC3821 Study Abroad Preparation (SP)

Orientation to the geography, history, and culture of the countries and sites to be studied in the study abroad program. Lecture.

### LARC3914 Planting Design I (FA)

Introduction to small scale projects involving use of plant materials in relation to other landscape elements, formulation of a vocabulary of plant materials and preparation of integrated planting plans and applicable specifications. Includes laboratory. Pre- or Corequisite: HORT 3103.

### LARC3924 Ecological Design (FA)

Continuation of LARC 3914 emphasizing a change in scale of projects to include medium and large scale projects, and increasing complexity in dealing with more complicated and varied planting designs and applicable specifications. Includes laboratory. Prerequisite: LARC 3914 and HORT 3133.

### LARC3933 Cultural Landscape Studies (SU)

The examination of landscape forms, and their historic and evolutionary development. Includes study of cultural, political, and site context influences. Required field trip component of study abroad. Prerequisite: LARC 3413 and LARC 3921.

### LARC4123 Urban Form Studies (SU)

The examination of urban, village, and suburban form and its influencing forces. Includes study of cultural forces, technological developments, and physical shape, scale, and materials that define urban areas. Required field trip component of study abroad. Prerequisite: LARC 3413 and LARC 3921.

### LARC4343 Planning Approaches to Geographic Information Systems (IR)

A survey of the decision making processes required for planning with geographic information systems. Review of the history of suitability mapping as the basis for computerized land planning models. Placement of modern suitability studies in the realm of regional planning through examination of criteria establishment, weighting, public input and data restrictions. Prerequisite: GEOG 4543.

### LARC4376 Landscape Architecture Design VII (FA)

(Formerly LARC 4375) Synthesis of all previous course work; an introduction to the theory and practice of larger scale planning with an emphasis on design of systems in urbanizing environments. Studio and lecture. Prerequisite: LARC 3366 and LARC 4413.

### LARC4383 Senior Project Preparation (SP)

(Formerly LARC 4381) Definition and planning of personally selected senior demonstration project. Requires full documentation of topical research, program development, site data collection, site analysis, and site project base maps. Studio and lecture. Prerequisite: LARC 4376

### LARC4413 Contemporary Landscape Architecture (FA)

Critical study and analysis of landscape architecture from mid-nineteenth century to the present. Emphasis on the philosophical and design theories that have influenced the form of gardens, parks, and cities.

### LARC4714 Landscape Architecture Construction IV (FA)

(Systems) Introduction to systems of landscape architectural construction including stormwater management, lighting, irrigation, water features, and erosion control. Emphasis on an advanced grading and landform manipulation skills, and stormwater system design and calculations. Significant integration of computer generated drawings. Lecture and laboratory. Prerequisite: LARC 2714.

### LARC4743 Site Planning for Non-Landscape Architects (IR)

Problems in analysis and synthesis of elements used in landscape with emphasis on grading and drainage and the relationship of structure to site. Lecture and laboratory 6 hours per week.

### LARC5043 Landscape Architecture Seminar (IR)

The role of the landscape architect in contemporary society; how this is affected by technological change and awareness of ecological problems. Group discussions, individual research projects, and guest lectures. Prerequisite: fourth-year standing.

### LARC5053 Historic Landscape Preservation (IR)

Survey of historic preservation as a profession and the emerging cultural landscape preservation movement. Introduction to preservation principles as described by the Secretary of the Interiors Standards and Guidelines. Analysis of case studies will reinforce basic philosophies and introduce preservation approaches. Prerequisite: LARC 3413 and LARC 4413.

### LARC5063 Alternative Stormwater Management (IR)

Introduction to the role of alternative stormwater management techniques including constructed wetlands, bioswales, rainwater harvesting, and other stormwater reduction techniques. Emphasis on constructed wetlands and multidisciplinary team approach to problem solving. Lecture and laboratory.

### LARC5386 Landscape Architecture Design VIII (Senior Demonstration Project) (FA)

(Formerly LARC 5385) Advanced design studio with an emphasis on individual or team research and design resolution. Includes all aspects of design process: inventory, programming, graphic documentation, formal oral presentation, and a written report. Prerequisite: LARC 4383 and LARC 4376.

### LARC5613 Landscape Architectural Practice and Project Manual (SP)

Professional ethics; office organization, client, contractor and landscape architect relationships; contracts and documents; review of bidding and contractual documents, including technical specifications.

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## (LAST) LATIN AMERICAN STUDIES

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### LAST2013 Latin American Studies (FA)

This course provides an interdisciplinary introduction to Latin America. Drawing on Latin American literature, history, sociology, and political science, the course examines the broad forces that have shaped the region.

### LAST3013 Modern Latin American Literature in Translation (IR)

This course introduces the rich cultural diversity and sociohistorical complexity of Latin America, through the exploration of outstanding and representative examples of the region's modern literature.

### LAST4003 Latin American Studies Colloquium (SP)

An interdepartmental colloquium with an annual change in subject of investigation, required of all Latin American studies majors. May be repeated for 6 hours. Prerequisite: sophomore standing for Latin American studies majors and honors students.

### LAST4003H Latin American Studies Colloquium (SP)

An interdepartmental colloquium with an annual change in subject of investigation, required of all Latin American studies majors. May be repeated for 6 hours. Prerequisite: sophomore standing for Latin American studies majors and honors students.

### LAST4173 The Latin American City (IR)

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. May be repeated.

### LAST470V Special Topics (1-6) (IR)

An examination of pertinent issues in Latin America. May be repeated.

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## (LATN) LATIN

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### LATN1003 Elementary Latin I (FA)

The rudiments of classical Latin, with concentration on grammar, vocabulary, and syntax. Short selections from ancient authors lead to basic reading ability.

### LATN1013 Elementary Latin II (SP)

A continuation of the rudiments of classical Latin, with concentration on grammar, vocabulary, and syntax. Short selections from ancient authors lead to basic reading ability. Prerequisite: LATN 1003 or equivalent.



**LATN2003 Petronius' Satyricon** (FA) Development of reading skills through selections from Satyricon, and an introduction to imperial history and culture through critical study of the novel in translation. Prerequisite: LATN 1013 or equivalent.

**LATN2013 Catullus** (SP) Development of reading skills through selections from Catullus' poems, and an introduction to the culture and history of the late republic through critical study of Catullus in translation and secondary works. Prerequisite: LATN 2003 or equivalent.

**LATN3003 Virgil and Ovid** (FA) Selections from the Aeneid and/or the Metamorphoses, and an introduction to Roman literary history through the critical study of these works in translation. Prerequisite: LATN 2013 or equivalent.

**LATN3013 Caesar** (SP) Selected readings from Caesar's commentaries on Gallic or Civil Wars, and an overview of Republican political and military history through the critical study of the commentaries in translation and secondary works. Prerequisite: LATN 3003 or equivalent.

**LATN3063 Intensive Reading in Latin I** (IR) Readings of various types of Latin from the earliest period to the present in accordance with the needs of the class.

**LATN4003 Roman History** (IR) Selections from Sallust, Livy, Tacitus, or Suetonius. An overview of Roman Historiography through the critical study of complete works in translation and secondary works. Prerequisite: LATN 3013 or equivalent.

**LATN4013 Roman Satire** (IR) 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. Prerequisite: LATN 3013 or equivalent.

**LATN4023 Roman Didactic Epic** (IR) Selections from Virgil's Georgics, Lucretius' De Retum Natura, or Manilius' Astronomica. An overview of Roman philosophical poetry through the critical study of complete works in translation and secondary works. Prerequisite: LATN 3013 or equivalent.

**LATN4033 Roman Drama** (IR) Selections from Plautus, Terence, or Seneca. An overview of Roman theater through the critical study of complete works in translation and secondary works. Prerequisite: LATN 3013 or equivalent.

**LATN4043 Roman Elegy** (IR) Selections from Propertius, Tibullus, or Ovid. An overview of the genre through the critical study of complete works in translation and secondary works. Prerequisite: LATN 3013 or equivalent.

**LATN4063 Roman Pastoral and Lyric** (IR) Selections from Catullus, Virgil's Eclogues, Horace's Odes, or Calpurnius Siculus. An overview of the two genres through the critical study of complete works in translation and secondary works. May be repeated for 6 hours. Prerequisite: LATN 3013 or equivalent.

**LATN4073 Roman Novel** (IR) Selections from Petronius or Apuleius. An overview of the genre through the critical study of complete works in translation and secondary works. Prerequisite: LATN 3013 or equivalent.

**LATN4083 Roman Oratory** (IR) 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. May be repeated for 6 hours. Prerequisite: LATN 3013 or equivalent.

**LATN4093 Roman Philosophy** (IR) 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. May be repeated for 6 hours. Prerequisite: LATN 3013 or equivalent.

**LATN4153 Roman Narrative Epic** (IR) Selections from Virgil, Ovid, Lucan, Statius, or Silius Italicus. An overview of the genre through the critical study of complete works in translation and secondary works. May be repeated for 6 hours. Prerequisite: LATN 3013 or equivalent.

**LATN475V Special Investigations (1-6)** (IR) May be repeated.

**LATN5633 Medieval Latin** (IR) Selections from medieval writers from the 4th to the 17th century. Prerequisite: LATN 3003 or equivalent.

**LATN575V Special Investigations (1-6)** (IR) May be repeated.

## (MATH) MATHEMATICS

**MATH0003 Beginning and Intermediate Algebra** (FA, SP, SU) For students who have inadequate preparation for taking MATH 1203. Credit earned in this course may not be applied to the total required for a degree.

**MATH1203 College Algebra** (FA, SP, SU) Credit will be allowed for only one of MATH 1203 and MATH 1285.

**MATH1213 Plane Trigonometry** (FA, SP, SU) Credit will be allowed for only one either MATH 1213 or MATH 1285.

**MATH1285 Precalculus Mathematics** (FA, SP) Topics in algebra and trigonometry. To be taken by students who expect to take MATH 2554.

**MATH2043 Survey of Calculus** (FA, SP, SU) Selected topics in elementary calculus and analytic geometry for students in business, agriculture, and social sciences. Credit will be allowed for only one of MATH 2043 and MATH 2554. Prerequisite: MATH 1203.

**MATH2040D Survey of Calculus Drill** (FA, SP, SU)

**MATH2053 Finite Mathematics** (FA, SP, SU) Selected topics in probability, vectors and matrices, linear programming. Terminal course for students in business, agriculture, and social sciences. This course will not prepare students to take other mathematical courses. Prerequisite: MATH 1203.

**MATH2053C Finite Mathematics** (FA, SP) Same as 2053 except taught with a two-day-per-week lecture and one-day-per-week drill (MATH 2050D). Corequisite: MATH 2050D. Prerequisite: MATH 1203.

**MATH2053H Honors Finite Mathematics** (FA, SP, SU)

**MATH2050D Finite Mathematics Drill** (FA, SP, SU) Co-Requisite: MATH 2053 C.

**MATH2103 Discrete Mathematics** (FA, SP, SU) Introductory study of sets, relations, logic, proofs, algorithms, counting methods, graph theory, trees, and Boolean algebras. Prerequisite: MATH 1203 or ACT math score of 21 or above.

**MATH2103H Honors Discrete Mathematics** (FA) Introductory study of sets, relations, logic, proofs, algorithms, counting methods, graph theory, trees, and Boolean algebras. Prerequisite: MATH 1203 or ACT math score of 21 or above.

**MATH2213 Survey of Mathematical Structures I** (FA, SP, SU) Sets and logic, systems of numerations, number systems and operations, elementary number theory. Prerequisite: MATH 1203.

**MATH2223 Survey of Mathematical Structures II** (FA, SP, SU) Geometry and measurement, statistics and probability. Prerequisite: MATH 1203.

**MATH2554 Calculus I** (FA, SP, SU) Derivative of functions of one variable, applications of the derivative, introduction of the integral, applications. Credit will be allowed for only one of MATH 2554 and MATH 2043. Prerequisite: MATH 1203 and MATH 1213 (or MATH 1285).

**MATH2554H Honors Calculus I** (FA, SP, SU) Topics in analytic geometry and calculus. Students may not receive credit for both MATH 2043 and MATH 2554.

**MATH2564 Calculus II** (FA, SP, SU) Integral calculus of one variable and infinite series. Prerequisite: MATH 2554.

**MATH2564H Honors Calculus II** (SP) Integral calculus of one variable and infinite series. Prerequisite: MATH 2554.

**MATH2574 Calculus III** (FA, SP, SU) Differential and integral calculus of several variables, vector calculus. Prerequisite: MATH 2564.

**MATH2574H Honors Calculus III** (FA, SP, SU) Differential and integral calculus of several variables, vector calculus. Prerequisite: MATH 2564.

**MATH3083 Linear Algebra** (FA, SP, SU) Systems of linear equations, vector spaces, linear transformations, matrices, determinants. Prerequisite: MATH 2554 or MATH 2043.

**MATH3103 Combinatorial and Discrete Mathematics** (SP) Basic combinatorial techniques including the study of networks, generating functions, principles of inclusion/exclusion, Zn, Hamming coding theory, graph theory, and block designs. Prerequisite: MATH 2103.

**MATH3113 Introduction to Abstract Algebra I** (FA, SP) Introduction to algebraic structures with emphasis on rigorous justification of results. Prerequisite: MATH 3083.

**MATH3133 History of Mathematics** (IR) Prerequisite: MATH 2554 and junior standing.

**MATH3203 Theory of Numbers** (IR) Prerequisite: MATH 2554 and junior standing.

**MATH3353 Numerical Methods** (FA, SP)

Approximate solution of algebraic equations and differential equations. Applications of numerical methods and finite differences to differentiation and integration. Prerequisite: MATH 2574 and proficiency in a high-level computer language.

**MATH3404 Differential Equations and Laplace Transform** (FA, SP, SU) First and second order ordinary differential equations, the Laplace transform, matrix systems of ordinary differential equations. Prerequisite: MATH 2574.

**MATH3423 Advanced Applied Mathematics** (FA, SP, SU) Matrices, Fourier analysis, partial differential equations. Prerequisite: MATH 3404.

**MATH3443 Complex Variable for Application** (SP) Complex analysis, series, conformal mapping. Prerequisite: MATH 3404.

**MATH3773 Foundations of Geometry I** (FA) Axiomatic method; Euclidean geometry; non-Euclidean geometry.

**MATH3923H Honors Colloquium** (IR) Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in mathematics).

**MATH399VH Honors Mathematics Course (1-6)** (FA, SP, SU) May be repeated for 12 hours. Prerequisite: junior standing.

**MATH400V Directed Readings (1-6)** (FA, SP, SU)

**MATH4103 Finite Dimensional Vector Spaces** (IR) Linear functionals, matrix representation of linear transformations, scalar product, spectral representation of linear transformations. Prerequisite: MATH 3083.

**MATH4113 Introduction to Abstract Algebra II** (FA) Topics in abstract algebra including finite abelian groups, linear groups, factorization in commutative rings, quadratic field extensions, Gaussian integers, Wedderburn's theorem, and multilinear algebra. Prerequisite: MATH 3113.

**MATH4153 Mathematical Modeling** (FA) 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. Prerequisite: MATH 3404.

**MATH4203 Linear Programming and Game Theory** (IR) Solution sets, duality, and pivoting in linear programming. Feasible solutions and the simplex method. The transportation problem. Matrix games. Prerequisite: MATH 3083 and proficiency in a high-level computer language.

**MATH4253 Symbolic Logic I** (FA) 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.

**MATH4263 Symbolic Logic II** (SP) Topics include: soundness and completeness of propositional logic, soundness and completeness of quantification theory, the elements of model theory and recursion theory, Gödel's incompleteness theorems, and the limitative theorems of Tarski and Church. Prerequisite: MATH 4253 or PHIL 4253.

**MATH4353 Numerical Linear Algebra** (SP) Numerical methods for problems of linear algebra, including the solution of very large systems, eigenvalues, and eigenvectors. Prerequisite: MATH 3083 and programming experience.

**MATH4363 Numerical Analysis** (FA) General iterative techniques, error analysis, root finding, interpolation, approximation, numerical integration, numerical solution of differential equations. Prerequisite: MATH 4513 and programming experience.

**MATH4503 Differential Geometry and Vector Calculus** (IR) Topics include: Vector differential and integral calculus, Stokes' Theorem in 3-space, classical differential geometry in 3-space (curves, surfaces), differential forms, general Stokes' Theorem, applications to hydrodynamics, and electromagnetism. Prerequisite: MATH 3083 and MATH 4513.

**MATH4513 Advanced Calculus I** (FA) The real and complex number systems, basic set theory and topology, sequences and series, continuity, differentiation, Taylor's theorem. Emphasis is placed on careful mathematical reasoning. Prerequisite: MATH 2574 and MATH 3083.

**MATH4523 Advanced Calculus II** (SP) The Riemann-Stieltjes integral, uniform convergence of functions, Fourier series, implicit function theorem, Jacobians, and derivatives of higher order. Prerequisite: MATH 4513.

## (LAWW) LAW

For course information, see the *School of Law Catalog*, available from the School of Law, Leflar Law Center, 1 University of Arkansas, Waterman Hall 107, Fayetteville, AR 72701, (479) 575-3102.



**MATH4932 Mathematics Major Seminar (FA, SP, SU)** The two-credit course has several components designed to address students' mathematical knowledge, problem-solving and communication skills. A series of weekly seminars on topics of historical or cross-disciplinary interest is accompanied by a weekly problem-solving seminar in which student presentations could play a part. The course also is a forum for sharing information about career opportunities and preparation for employment.

**MATH498V Senior Thesis (1-6) (FA, SP, SU)**

**MATH5013 Topics in Algebra for Teachers (IR)** Topics from abstract and linear algebra of current interest to teachers. May be repeated. Prerequisite: graduate standing.

**MATH5033 Topics in Analysis for Teachers (IR)** Topics related to calculus of current interest to secondary school teachers. May be repeated. Prerequisite: graduate standing.

**MATH504V Special Topics for Teachers (1-6) (IR)** Current topics in mathematics of interest to secondary school teachers. May be repeated. Prerequisite: graduate standing.

**MATH510V Mathematical Seminar (1-3) (FA)** Members of the faculty and advanced students meet for presentation and discussion of topics. Prerequisite: graduate standing.

**MATH5123 Algebra I (SP)** What the beginning graduate student should know about algebra: groups, rings, fields, modules, algebras, categories, homological algebra, Galois Theory. Prerequisite: MATH 3113.

**MATH5133 Algebra II (FA)** Continuation of 5123. Prerequisite: MATH 5123.

**MATH5303 Ordinary Differential Equations (FA)** Existence, uniqueness, stability, qualitative behavior, and numerical solutions. Prerequisite: MATH 3404 and MATH 4513 and programming experience.

**MATH5313 Partial Differential Equations (SP)** Classification, boundary value problems, applications, numerical solutions. Prerequisite: MATH 3423 and MATH 4513.

**MATH5453 Functional Analysis I (SP, Odd years)** Linear vector spaces, linear operators. Prerequisite: MATH 5513.

**MATH5503 Theory of Functions of a Real Variable I (FA)** 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, bounded linear functionals on the  $L^p$  spaces. Prerequisite: MATH 4523.

**MATH5513 Theory of Functions of a Real Variable II (SP)** Measure and integration on abstract measure spaces, signed measures, Hahn decomposition, Radon-Nikodym theorem, Lebesgue decomposition, measures on algebras and their extensions, product measures, Fubini's theorem. Prerequisite: MATH 5503.

**MATH5523 Theory of Functions of a Complex Variable I (FA)** Complex numbers, analytic functions, power series, complex integration, Cauchy's Theorem and integral formula, maximum principle, singularities, Laurent series, Mibius maps. Prerequisite: MATH 4513.

**MATH5533 Theory of Functions of a Complex Variable II (SP)** Riemann Mapping Theorem, analytic continuation, harmonic functions, entire functions. Prerequisite: MATH 5523.

**MATH5703 Foundations of Topology (FA)** Metric and general topological spaces, separation axioms, Urysohn's lemma, Tietze extension theorem, connectedness, compactness, and the Tychonoff theorem. Prerequisite: MATH 4513.

**MATH5713 Algebraic Topology (FA)** Homotopy, singular and relative homology, excision theorem, the Mayer-Vietoris sequence, Betti numbers, and the Euler characteristic. Prerequisite: MATH 5703.

**MATH600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**MATH610V Directed Readings (1-6) (IR)**

**MATH619V Topics in Algebra (1-6) (FA, SP, SU)** Current research interests in algebra. May be repeated.

**MATH659V Topics in Analysis (1-6) (FA, SP, SU)** Current research interests in analysis. May be repeated.

**MATH679V Topics in Topology (1-6) (FA, SP, SU)** Current research interest in topology. May be repeated.

**MATH700V Doctoral Dissertation (1-6) (FA, SP, SU)**

## (MBAD) MASTERS OF BUSINESS ADMINISTRATION

**MBAD5013 MBA Foundations I (SU)** A focus on leadership, teamwork, process improvement, and communication, in association with business content, in the area of, information technology, quantitative analysis, marketing management, and managing people and the organization. Corequisite: MBAD 5023. Prerequisite: admission to the M.B.A. program and satisfactory completion of the M.B.A. preparation work.

**MBAD5023 MBA Foundations II (SU)** A focus on leadership, teamwork, process improvement and communication, in association with business content in the areas of financial and economic analysis and production and operations management. Corequisite: MBAD 5013.

**MBAD5112 Corporate Financial Management (FA)** Financial analysis, planning and control; decision making and modeling for financial managers; and financial policies for management. Corequisite: MBAD 5132 and MBAD 5222. Prerequisite: MBAD 5122 and MBAD 5212 and MBAD 5232.

**MBAD5122 Accounting Decisions and Control (FA)** Preparation and utilization of financial information for internal management purpose: planning and special decisions, cost determination, performance evaluation, and controls. Corequisite: MBAD 5212 and MBAD 5232.

**MBAD5132 Information Technology and Decision Making (FA)** Utilization of information, quantitative techniques, and computer application in decision making and problem solving for managers. Corequisite: MBAD 5112 and MBAD 5222. Prerequisite: MBAD 5122 and MBAD 5212 and MBAD 5232.

**MBAD5212 Leading High Performance Organizations (FA, SP)** Managing in a global workforce, including human resource issues, motivation, performance evaluation, quality concepts, transformational leadership, and selection/recruitment/ development of employees. Corequisite: MBAD 5122 and MBAD 5232.

**MBAD5222 Managing Ideas, Products, and Services (FA, SP)** Product management, market research, marketing communications, retailing and distribution, consumer behavior, and social and ethical implications of marketing. Corequisite: MBAD 5112 and MBAD 5132. Prerequisite: MBAD 5122 and MBAD 5212 and MBAD 5232.

**MBAD5232 Economics of Management and Strategy (FA, SP)** Information economics and applied game theory. Corequisite: MBAD 5212 and MBAD 5423.

**MBAD5313 Strategic Management (FA)** 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. Prerequisite: MBAD 5212 and MBAD 5222 and MBAD 5232.

**MBAD5413 Partnering Project I (SP)** A large-scale, real world, 10 week project involving hands-on work addressing issues faced by managers in partnering firms. Corequisite: MBAD 5313 and MBAD 5423.

**MBAD5423 Partnering Project II (SP)** Continuation of MBAD 5413. Corequisite: MBAD 5313 and MBAD 5413.

**MBAD5433 Capstone Project (FA, Odd years)** A large-scale project integrating various business topics. Corequisite: MBAD 5313.

**MBAD5511 Focus Topic I (FA)** A concentrated emphasis on one business topic. Corequisite: MBAD 5212, MBAD 5122 and MBAD 5232. Prerequisite: MBAD 5023.

**MBAD5521 Focus Topic II (FA)** A concentrated emphasis on business topic. Pre- or Corequisite: MBAD 5212, MBAD 5222, and MBAD 5232. Prerequisite: MBAD 5112, MBAD 5122, and MBAD 5132.

## (MBIO) MICROBIOLOGY

**MBIO2013 General Microbiology (FA, SP, SU)** Basic concepts of microbiology including diversity, genetics, metabolism, growth, control of growth, pathogenesis, and immunology. Corequisite: MBIO 2011L. Prerequisite: BIOL 1543 and BIOL 1541L and 2 semesters of general chemistry.

**MBIO2013H Honors General Microbiology (FA, SP, SU)** Basic concepts of microbiology including diversity, genetics, metabolism, growth, control of growth, pathogenesis, and immunology. Corequisite: MBIO 2011L or MBIO 2011M. Prerequisite: BIOL 1543 and BIOL 1541L and 2 semesters of general chemistry.

**MBIO2011L General Microbiology Laboratory (FA, SP, SU)** Techniques for handling microorganisms. Corequisite: MBIO 2013.

**MBIO2011M Honors General Microbiology Laboratory (FA, SP, SU)** Corequisite: MBIO 2013.

**MBIO2103 Microorganisms in Human Affairs (SP, SU)** Especially for students who are enrolled in the program for Associate Degree in Nursing as well as those preparing for professions in health care. Basic concepts of microbiology are presented and particular emphasis is made on microorganisms that are pathogenic for mankind. Lecture 2 hours, laboratory 2 hours per week. Corequisite: MBIO 2100L. Prerequisite: CHEM 1023 and CHEM 1021L or equivalent.

**MBIO3023 Microbial Cell Structure (SP, SU)** An in-depth study of microbial structure and function. Prerequisite: MBIO 2013 and MBIO 2011L and general chemistry.

**MBIO4003 Laboratory Techniques in Microbiology (FA)** Provides experience with laboratory techniques in microbial physiology, metabolism, and genetics. Laboratory 6 hours per week. Prerequisite: MBIO 2013 and MBIO 2011L and CHEM 3603 and CHEM 3601L and CHEM 3613 and CHEM 3611L.

**MBIO4124 Food Microbiology (SP)** Microbiology, contamination, preservation, and spoilage of different kinds of foods, food poisoning, sanitation, control, and inspection; microbiology of water; and standard methods for official food and public health laboratories. Lecture 2 hours, laboratory 4 hours per week. Corequisite: MBIO 4120L. Prerequisite: MBIO 2013 and MBIO 2011L and CHEM 1123 and CHEM 1121L or equivalent.

**MBIO4120L Food Microbiology Laboratory (SP)** Corequisite: MBIO 4124.

**MBIO4233 Microbial Genetics (FA)** Principles of molecular genetics in microorganisms, including the concepts of DNA structure and function, mutation, transformation, conjugation, transduction, recombination, and genetic engineering. Prerequisite: MBIO 2013 and MBIO 2011L and CHEM 3603 and CHEM 3601L and CHEM 3613 and CHEM 3611L.

**MBIO4303 Physiology of Microorganisms (FA)** Life processes of microorganisms. Prerequisite: MBIO 2013 and MBIO 2011L and CHEM 3603 and CHEM 3601L and CHEM 3613 and CHEM 3611L.

**MBIO4443 Molecular Virology (SP, Odd years)** Presents the molecular mechanisms underlying viral life-cycles; tropism and host cell recognition, penetration, genome replication, gene expression, transformation, assembly, nucleic acid packaging, and egress. Emphasis placed on experimental approaches. Lecture 3 hours per week. Prerequisite: (MBIO 4233 or BIOL 3323) and (MBIO 4753 or BIOL 2533) or graduate standing.

**MBIO4703 Mechanisms of Pathogenesis (FA)** A survey of the events causing human disease at the molecular, cellular and genetic levels. Seeks to develop an appreciation that both the tricks pathogens use add the body's own defenses contribute to pathology. Prerequisite: BIOL 2013 and BIOL 2011L and BIOL 2533.

**MBIO4714 Basic Immunology (SP)** A general overview of immunity with emphasis on the underlying cellular, molecular, and genetic events, and discussions of more specialized issues in immunology, such as disease states involving the immune system, and other interesting problems in modern Immunology. Lecture 2 hours, laboratory 4 hours per week. Corequisite: MBIO 4710L. Prerequisite: MBIO 2013 and MBIO 2011L (or BIOL 2534 or ZOOL 2213 and ZOOL 2211L or equivalent).

**MBIO4710L Basic Immunology Laboratory (SP)** Corequisite: MBIO 4714.

**MBIO4753 General Virology (SP)** 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. Corequisite: MBIO 4750D. Prerequisite: MBIO 2013 and MBIO 2011L, (MBIO 4233 or ANSC 3123 or POSC 3123 or BIOL 3323 and BIOL 3321L) and junior standing.

**MBIO4750D General Virology Drill (SP)** Discussion of research articles and specific relating to lecture in MBIO 4753. Corequisite: MBIO 4753.

**MBIO480V Special Problems (1-6) (FA, SP, SU)** May be repeated for 6 hours.

**MBIO490V Special Topics in Microbiology (1-6) (IR)** Consideration of new areas of microbiological knowledge not yet treated adequately in textbooks or in other courses. Prerequisite: 8 hours of biological sciences.

**MBIO5264 Soil Microbiology (FA, Odd years)** A study of the microorganisms in soil and the biochemical processes for which they are responsible. Lecture 3 hours,

laboratory 3 hours per week. (Same as CSES 5264)  
Corequisite: MBIO 5260L. Prerequisite: MBIO 2013 and MBIO 2011L.

**MBIO5260L Soil Microbiology Laboratory (FA, Odd years)** Laboratory exercises related to the study of microorganisms in soil and the biochemical processes for which they are responsible. Laboratory 3 hours per week. (Same as CSES 5260L) Corequisite: MBIO 5264.

**MBIO5343 Advanced Immunology (FA)** 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.

**MBIO5352L Immunology in the Laboratory (SP)** 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 MBIO 5343.

## (MEEG) MECHANICAL ENGINEERING

**MEEG1103 Introduction to Mechanical Engineering (FA, SP)** Introduction of the mechanical engineering profession to 1st year students using mechanical engineering projects and experiments. Corequisite: MEEG 1100D and MEEG 1100L.

**MEEG1100D Introduction to Mechanical Engineering Drill (FA, SP)** Prerequisite: MEEG 1103 and MEEG 1100L.

**MEEG1100L Introductory Mechanical Engineering Laboratory I (FA, SP)** Corequisite: MEEG 1103 and MEEG 1100D.

**MEEG1113 Mechanical Engineering Fundamentals (FA, SP)** Introduction to the application of computer technology and resources to the mechanical engineering profession through the use of mechanical engineering projects and experiments. Corequisite: MEEG 1110L. Prerequisite: (GNEG 1122 or equivalent) and MEEG 1103 and MATH 2554.

**MEEG1110L Mechanical Engineering Fundamentals Laboratory (FA, SP)** Corequisite: MEEG 1113.

**MEEG2003 Statics (FA, SP, SU)** Equilibrium and resultants of force systems in a plane and in space; analysis of structures, friction, centroids, and moments of inertia. Analysis methods are emphasized. Recitation 3 hours, drill 2 hours per week. Corequisite: MEEG 2000D. Prerequisite: PHYS 2054 and MATH 2564.

**MEEG2000D Statics Drill (FA, SP, SU)** Corequisite: MEEG 2003.

**MEEG2013 Dynamics (FA, SP, SU)** Kinematics and kinetics of particle and of rigid bodies; work and energy; impulse and momentum, and special topics. Corequisite: MEEG 2010D. Prerequisite: MATH 2574 and MEEG 2003.

**MEEG2010D Dynamics Drill (FA, SP, SU)** Corequisite: MEEG 2013.

**MEEG2023 Introductory Mechanics (FA)** This is a combined course covering basic parts of MEEG 2003 Statics and MEEG 2013 Dynamics. The topics include fundamentals in mechanics, forces, moments, equilibrium of particles and rigid bodies, kinematics and kinetics of particles. Mechanical Engineering students will not be given degree credit for this class. Prerequisite: PHYS 2054 and MATH 2574.

**MEEG2303 Introduction to Materials (FA, SP, SU)** A study of chemical, physical, and electrical properties of materials using fundamental atomistic approach. The materials of interest are: metals, polymers, ceramics, and composites. The interactive relationship between structure, properties, and processing of materials will be emphasized. A number of experiments are performed. Drill 2 hours per week. Corequisite: MEEG 2300D. Prerequisite: MATH 2554, PHYS 2054 and CHEM 1123.

**MEEG2300D Introduction to Materials Drill (FA, SP, SU)** Corequisite: MEEG 2303.

**MEEG2403 Thermodynamics (FA, SP, SU)** A study of the 1st and 2nd laws of thermodynamics. Availability of energy, properties of liquids, gases, and vapors; nonflow and flow processes. Recitation 3 hours, drill 2 hours per week. Corequisite: MEEG 2400D. Prerequisite: PHYS 2054 and MATH 2564.

**MEEG2400D Thermodynamics Drill (FA, SP, SU)** Corequisite: MEEG 2403.

**MEEG3013 Mechanics of Materials (FA, SP, SU)** Stress and deformation of members in tension, compression, torsion, and bending, and the design of these members. Columns, statically indeterminate beams, and simple connections. Prerequisite: MEEG 2003.

**MEEG3103 Mechanisms (FA, SU)** Kinematics and kinetics of mechanisms. Dynamic forces and gear and cam design and analysis. Recitation three hours per week and drill one hour per week. Corequisite: MEEG 3100D. Prerequisite: MEEG 1113 and MEEG 2013.

**MEEG3100D Mechanisms Drill (FA, SU)** A non-credit drill session to accompany MEEG 3103 in which students are given assistance in working the assigned material. Corequisite: MEEG 3103.

**MEEG3113 Machine Dynamics and Control (FA, SP)** The principles of kinematics and kinetics for rigid body motion from dynamics are reviewed and applied to machine components with the goal being to determine their impact on machine behavior and performance. The time varying forces created by the movement of machine components are used to describe the machine's vibrational motion and elementary control principles are introduced with the goal of describing how these motions might be reduced or eliminated. Corequisite: MEEG 3110D. Prerequisite: MEEG 3103 and MATH 3404.

**MEEG3110D Machine Dynamics and Control Drill (FA, SU)** A non-credit drill session to accompany MEEG 3113 in which students are given assistance in working the assigned material. Corequisite: MEEG 3113.

**MEEG3123 Design Stress Analysis (SP, SU)** Selection and sizing of machine components for both static and dynamic loads. Recitation 3 hours per week. Prerequisite: MEEG 3013.

**MEEG3202 Mechanical Engineering Laboratory I (FA, SP)** Introduction to measurement, uncertainty, data acquisition, and instrumentation with an emphasis in materials and manufacturing. Corequisite: MEEG 3200D and MEEG 3200L. Prerequisite: ELEG 3903, MEEG 2303, MEEG 1103 and GNEG 1122.

**MEEG3200D Mechanical Engineering Lab I Drill (FA, SP)** Corequisite: MEEG 3200L and MEEG 3202.

**MEEG3200L Mechanical Engineering Laboratory I (FA, SP)** Corequisite: MEEG 3200D and MEEG 3202.

**MEEG3212 Mechanical Engineering Laboratory II (FA, SP)** Signal conditioning, data acquisition, and uncertainty analysis with an emphasis in mechanical systems. Corequisite: MEEG 3210D and MEEG 3210L. Prerequisite: ELEG 3913, MEEG 3202, MEEG 3113 and MEEG 3013.

**MEEG3210D Mechanical Engineering Laboratory Drill II (FA, SP)** Corequisite: MEEG 3210L and MEEG 3212.

**MEEG3210L Mechanical Engineering Laboratory II (FA, SP)** Corequisite: MEEG 3210D and MEEG 3212.

**MEEG3403 Thermodynamics II (FA)** A continuation of MEEG 2403. Properties of real gases, heat engine cycles and applications to heat engines and refrigeration cycles. Mixtures of gases and vapors. Fundamental combustion theory. Prerequisite: MEEG 1103 and MEEG 2403.

**MEEG3503 Mechanics of Fluids (FA)** A study of fluids including properties, pressure forces, and field flow utilizing conservation of mass, conservation of energy, and momentum principles. Prerequisite: MEEG 2403.

**MEEG3703 Numerical Methods I (SP, SU)** Polynomial interpolation, computations with series, numerical integration, statistics, and the numerical solution of simultaneous and ordinary differential equations. Pre- or Corequisite: MATH 3404. Corequisite: MEEG 3700D.

**MEEG3700D Numerical Methods I Drill (FA, SU)** Corequisite: MEEG 3703.

**MEEG4003 Intermediate Dynamics (SP)** Principles and application of dynamics from a more advanced point of view than in MEEG 2013. Topics include use of rotating reference frames, kinematics, and kinetics of rigid bodies in 3 dimensions, and oscillations. Prerequisite: MEEG 2013.

**MEEG4063 Production Engineering (FA, SP)** Fundamentals of the production arena: engineering statistical problem solving, basic manufacturing process and machine fundamentals, engineering process quality control. Lecture 3 hours per week. Corequisite: MEEG 4060L. Prerequisite: MEEG 2303 and MEEG 3123 and MEEG 3212.

**MEEG4060L Production Engineering Laboratory (FA, SP)** Corequisite: MEEG 4063.

**MEEG4103 Machine Element Design (FA, SU)**

Selection of design components commonly used in modern machines, principally for energy transmission. Recitation 3 hours per week. Prerequisite: MEEG 3013.

**MEEG4123 Finite Element Methods I (SP)** Introduction to the use of the finite element method in mechanical engineering analysis and design. Use of commercial software to solve thermal and mechanical problems. Prerequisite: MEEG 3703 or MATH 3353.

**MEEG4133 Creative Project Design II (FA, SP)** Student groups will present their corrected proposal to a faculty panel and then carry out their project to completion. Each student group will make timely progress reports, verify the correctness of their completed project, and present their final report to their faculty panel. Prerequisite: MEEG 4132 and (MEEG 4103 or MEEG 4413).

**MEEG4132 Creative Project Design I (FA, SP)** Design proposal preparation, design codes, professional ethics, and product liability issues. Students will select a design project, and each student group will prepare a formal written proposal on their project for presentation to a faculty panel. This group project will be carried to completion in MEEG 4133. Prerequisite: MEEG 3113 and MEEG 3503.

**MEEG4202 Mechanical Engineering Laboratory III (FA, SP)** Application of measurement techniques to mechanical engineering problems with an emphasis in thermal systems. Pre- or Corequisite: MEEG 4413. Corequisite: MEEG 4200L. Prerequisite: MEEG 3212.

**MEEG4200L Mechanical Engineering Laboratory III (FA, SP)** Corequisite: MEEG 4202.

**MEEG4213 Control of Mechanical Systems (FA)** Mathematical modeling for feedback control of dynamic mechanical systems with design techniques using Laplace transforms, state variables, root locus, frequency analysis, and criteria for performance and stability. (Same as CENG 4403, CSEG 4403, ELEG 4403) Prerequisite: MEEG 3113.

**MEEG4223 System and Signal Analysis (IR)** Discrete and continuous time dynamic systems, convolution, Fourier and z-transforms, FFT, stability, frequency response, filtering, state variable models, and analysis. Digital system simulation. Mason's Rule. Credit cannot be earned for both MEEG 4233 and ELEG 3123. Prerequisite: (ELEG 2113 or ELEG 3903) and MATH 3404.

**MEEG4233 Microprocessors in Mechanical Engineering I: Electromechanical Systems (IR)** Microcomputer architectural, programming, and interfacing. Smart product design (microprocessor-based design). Control of DC and stepper motors and interfacing to sensors. Applications to robotics and real-time control. Mobile robot project. Digital and analog electronics are reviewed where required. Prerequisite: ELEG 3913 or equivalent.

**MEEG4303 Materials Laboratory (SP)** A study of properties, uses, testing, and heat treatment of basic engineering materials. Lecture 1 hour, laboratory 4 hours per week. Corequisite: MEEG 4300L. Prerequisite: MEEG 2303 and MEEG 3013.

**MEEG4300L Materials Laboratory (SP)** Corequisite: MEEG 4303.

**MEEG4403 Thermal Systems Laboratory (FA, SP, SU)** Selected experiments dealing with heat transfer applications. Lecture 1 hour, laboratory 4 hours per week. Corequisite: MEEG 4400L. Prerequisite: MEEG 4202.

**MEEG4400L Thermal Systems Laboratory (SP)** Corequisite: MEEG 4403.

**MEEG4413 Heat Transfer (SP, SU)** Basic thermal energy transport processes; conduction, convection, and radiation; and the mathematical analysis of systems involving these processes in both steady and time-dependent cases. Prerequisite: MEEG 3503.

**MEEG4423 Steam Power Plants (FA, Odd years)** Detailed study of steam power plants and equipment; fuels and combustion calculations; fuel handling and storage; furnaces, boilers, and draft apparatus; types of prime movers; condensers and their auxiliaries. Prerequisite: MEEG 3403.

**MEEG4433 Propulsion (FA, Even years)** Principles, operation, and characteristics of reciprocating engines, gas turbines, turbojets, and rockets. Brief study of novel propulsion systems. Prerequisite: MEEG 3403 and MEEG 3503.

**MEEG4443 Thermal and Vibration Analysis and Testing of Electronics (IR)** Packaging, manufacture, and failure mechanisms of boards and assemblies. Analysis of overheating, thermal stress, and vibration. Laboratory testing and environmental stress screening. Corequisite: MEEG 4440L. Prerequisite: INEG 4513 or ELEG 4273.

**MEEG4440L Thermal and Vibration Analysis and Testing of Electronics Laboratory (IR)** Laboratory 1 hour per week in support of MEEG 4443. Corequisite: MEEG 4443.



**MEEG4453 Industrial Waste and Energy Management (SP)** 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. Prerequisite: MEEG 3503 and MEEG 4413.

**MEEG4473 Indoor Environmental Control (FA)** 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. Prerequisite: MEEG 4413.

**MEEG4483 Thermal Systems Analysis and Design (FA, SU)** 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. Prerequisite: MEEG 4413.

**MEEG4603 Basic Nuclear Engineering (SP)** Principles of atomic and nuclear physics, including: fusion and fission reactions, radioactive decay, and neutron interactions. Introduction to nuclear reactor theory, types, components, and behavior. Prerequisite: PHYS 2074 and MATH 2574.

**MEEG4623 Radiation Protection and Shielding (IR)** Aspects of personnel radiation protection and shielding design as applied to the operating nuclear power plant, research laboratory, or other nuclear facility. Prerequisite: PHYS 2074 and MATH 2574.

**MEEG4633 Nuclear Power Generation (IR)** Thermal energy analysis and design of nuclear power reactors and power plants including thermodynamic analysis of components and cycle, thermal hydraulic aspects, core energy distribution, and fluid transients. Emphasis is on pressurized water reactors and boiling water reactors. Prerequisite: MEEG 3503 and MATH 3404 and MEEG 2403.

**MEEG4703 Mathematical Methods in Engineering (FA)** Determinants, matrices, simultaneous equations, eigenvalues, eigenvectors, and coordinate transformations of matrices; vector algebra and calculus, integral theorems, curvilinear coordinates, covariant and contravariant tensors. Applications of tensor algebra and calculus to mechanics. Prerequisite: MATH 2574.

**MEEG4813 Air Pollution Abatement (SP)** Design of air pollution abatement systems and equipment including cyclones, bag filters, and scrubbers. Other topics discussed are air pollution regulations: permitting, dispersion modeling, and national air quality standards.

**MEEG4843 Environmentally Conscious Design and Manufacturing (FA)** The course will provide an introduction to the environmental aspects of production design and illustrate the consequences and costs of waste generation and pollution abatement. The course will also define pollution prevention and waste minimization techniques and will introduce the student to the design for the environment (DfE) concept, life cycle analysis, and total quality environmental management techniques.

**MEEG4903H Mechanical Engineering Honors Research (FA, SP)** Independent research for mechanical engineering honors students. Prerequisite: honors candidacy.

**MEEG491V Special Projects (1-6) (FA, SP, SU)**

**MEEG5003 Continuum Mechanics (SP)** Cartesian tensor and index notation; Lagrangian and Eulerian description; analyses of stress and strain, coordinate transformations, invariants, principal values and principal directions, stress and strain quadrics, equations of equilibrium, and compatibility equations; Reynolds transport theorem, balance of momenta, continuity equation, 1st and 2nd laws of thermodynamics, application to solids and fluids. Prerequisite: MEEG 3013 and MEEG 4703.

**MEEG5013 Advanced Mechanical Vibrations (IR)** Continuation of MEEG 4013 with a more analytic approach. Included are techniques for modeling and understanding the vibratory behavior of multi-degree of freedom discrete systems, continuous systems, nonlinear systems, and random variables. Prerequisite: MEEG 4013.

**MEEG5033 Advanced Mechanics of Materials I (IR)** 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.

**MEEG5103 Structural Dynamics (FA)** Forced and random vibration response of complex structural systems are studied through the use of the finite element method. Computational aspects of these problems are discussed and digital computer applications undertaken. Prerequisite: MEEG 4103 and graduate standing.

**MEEG5113 Modal Analysis Methods (SP)**

Fundamental concepts of both analytical and experimental modal analysis methods are examined and applied to the study of complex structural systems. Computational aspects of these problems are discussed, and digital computer applications undertaken with experimental verification. Prerequisite: MEEG 5103 and graduate standing.

**MEEG5123 Finite Elements Methods II (SP)**

Development and application of finite element (FE) methods used to solve transient and two-dimensional boundary value problems. Applications are taken from solid and fluid mechanics, heat transfer, and acoustics. Emphasis is placed on the FE methodology to make accessible the research literature and commercial software manuals, and to encourage responsible use and interpretation of FE analysis. May be repeated for 3 hours. Prerequisite: MEEG 4123 and graduate standing or consent.

**MEEG5143 Advanced Machine Design (SU)**

Application of advanced topics such as probability theory, fracture mechanics, and computer methods to the design and analysis of complex mechanical systems. Prerequisite: MEEG 4103 and graduate standing.

**MEEG5213 Microprocessors in Mechanical**

**Engineering II Real-time Control (IR)** Feedback control system theory and design. C programming. Microcontroller interfacing. Real-time control of electromechanical systems in laboratory projects using a single-board computer as the controller. Prerequisite: MEEG 4233.

**MEEG5273 Electronic Packaging (FA)**

An introductory treatment of electronic packaging from single chip to multichip including materials, electrical design, thermal design, mechanical design, package modeling and simulation, processing considerations, reliability, and testing. Credit cannot be earned for both MEEG 5273 and ELEG 5273. (Same as ELEG 5273) Prerequisite: (ELEG 3213 or ELEG 3913) and MATH 3404.

**MEEG5303 Physical Metallurgy (IR)** Physical and chemical properties of solids and the application of materials in commerce. Lecture 4 hours per week. Prerequisite: MATH 3404.

**MEEG5393 Engineering Materials Topics (IR)**

Detailed study of selected materials engineering topics; topics will vary, but may include diffusion processes in solids, thermodynamics of solids, fracture of materials, failure analysis, advanced techniques in electron microscopy, analytical methods in materials science, advanced corrosion and engineering, etc. Prerequisite: graduate standing.

**MEEG5403 Advanced Thermodynamics (FA)**

An in-depth review of classical thermodynamics, including availability analysis, combustion, and equilibrium, with an introduction to quantum mechanics and statistical thermodynamics. Prerequisite: (MEEG 3403 and MATH 3404) or equivalent.

**MEEG5423 Statistical Thermodynamics (SP, Odd**

**years)** Concepts and techniques for describing high temperature and chemically reactive gases from a molecular point of view. Introductory kinetic theory, chemical thermodynamics, and statistical mechanics applied. Prerequisite: MEEG 3403 and MATH 2574.

**MEEG5433 Combustion (SP, Even years)**

Introduction to combustion of solid, liquid, and gaseous fuels. Equilibrium and kinetics of hydrocarbon oxidation, laminar and turbulent flames, premixed and non-premixed combustion processes, ignition, quenching, stability, emissions, diagnostics. Prerequisite: (MEEG 3403 and MATH 3404) or equivalent.

**MEEG5453 Advanced Heat Transfer (SP)** More in-depth study of topics covered in MEEG 4413, Heat Transfer, and coverage of some additional topics. Prerequisite: MEEG 4413 or CHEG 3143 or equivalent.

**MEEG5463 Conduction and Convection Heat**

**Transfer (SU, Even years)** Deeper, broader coverage of topics studied in MEEG 4413 and 5453. Steady and transient, one and multidimensional conduction with emphasis on solution methods, analytical and numerical. Forced and free convection in laminar and turbulent, internal and external flow. Porous media heat and mass transfer and/or mass diffusion. Prerequisite: MEEG 5453 or equivalent.

**MEEG5473 Radiation Heat Transfer (SU, Odd**

**years)** Spectral analysis, radiant exchange in gray and non-gray enclosures, gas radiation, and multi-mode heat transfer. Prerequisite: MEEG 5453 or equivalent.

**MEEG5503 Advanced Fluid Dynamics I (FA)**

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 3404.

**MEEG5513 Gas Dynamics (SP, Even years)** Basic concepts of gas dynamics and gas properties applied to compressible flows including quasi one-dimensional isentropic flow in variable area ducts, normal shock waves, flow in ducts with friction, heating and cooling, oblique shock and expansion waves and shock tube flow. Prerequisite: MEEG 3503 and MEEG 3403 and MATH 2574.

**MEEG5643 Nuclear Heat Transport (IR)** Heat generation and removal in nuclear power reactors, including water, gas, and liquid-metal cooled designs; boiling and 2-phase flow considerations. Prerequisite: MEEG 4603 and MEEG 4413 and MEEG 3503.

**MEEG5733 Numerical Methods II (SP)** 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; computer applications. Prerequisite: MEEG 3703 or MATH 3353.

**MEEG590V Research (1-6) (FA, SP, SU)** Fundamental or applied research. Prerequisite: graduate standing.

**MEEG591V Special Problems (1-6) (FA, SP, SU)**

Prerequisite: graduate standing.

**MEEG600V Master's Thesis (1-6) (FA, SP, SU)**

Prerequisite: graduate standing.

**MEEG6273 Advanced Electronic Packaging (SP)**

An advanced treatment of electronic packaging concentrating on multichip modules. Topics covered include electrical design, thermal design, mechanical design, package modeling and simulation, computer-aided engineering and design, processing limitations on MCM performance, reliability, testing, and economic considerations. (Same as ELEG 6273) Prerequisite: ELEG 5273.

**MEEG6800 Graduate Seminar (FA, SP)** A periodic seminar devoted to mechanical engineering research topics. Appropriate grade to be "S."

**MEEG700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (MEPH) MICROELECTRONICS- PHOTONICS

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**MEPH 5613 Introduction to Advanced Computation for Scientists and Engineers (SU)** Introduction to computer modeling in science and engineering and their advantages. Review of programming needed for modeling applications. Introduction to finite difference and finite element procedures to solve science and engineering problems. Importance of visualization and grid generation. Prerequisite: senior or graduate student in Science or Engineering.

**MEPH 5713 Advanced Nanomaterials Chemistry**

**(FA)** Most science and engineering graduates will one day face materials problems. Nanomaterials are evolving to be the backbone of high-tech industry. Modern as well as future industry demands more and more scientists and engineers with materials chemistry knowledge. Learn how to understand materials from the perspective of fundamental chemistry principles, be exposed to the frontiers of materials science and technology, and build up a picture of tomorrow's materials. Pre- or Corequisite: lab experience in physics, chemistry, or biology. Prerequisite: general chemistry.

**MEPH 5723 Science of Nanostructures (SP)**

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. Prerequisite: MEPH 5713.

**MEPH 5801 Graduate Seminar (FA, SP, SU)** Papers presented by candidates for the Master of Science degree in Microelectronics-Photonics on leading edge topics in the field. Prerequisite: graduate standing.

**MEPH 5811 Operations Seminar (FA, SP, SU)**

Weekly seminar of Microelectronics-Photonics candidates for the Master of Science degree to discuss issues that impact a technical group's operational effectiveness. Topics to be discussed include ethics, applications of procedures, cultural impact on operations, and team based methodologies. Discussions of current events in the interaction between technology and human affairs will be included as appropriate. Prerequisite: graduate standing.



**MEPH 5821 Ethics for Scientists and Engineers (SU)** 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.

**MEPH 5831 Proposal Writing and Management (SU)** Advanced scientific and engineering research and development typically requires significant resources to be successful. This course introduces the student to the factors that impact proposal success in both the academic and industrial arenas; it demonstrates different approaches to writing the content of different sections of successful proposals; and it introduces the student to the legal responsibilities and ramifications of proposal management. At the end of the class, each student will have ready for submission at least one proposal to an appropriate funding agency for their research group. Prerequisite: graduate standing.

**MEPH 587V Special Topics in Microelectronics-Photonics (1-3) (FA, SP, SU)** Consideration of current microelectronic-photonics topics not covered in other courses.

**MEPH 588V Special Problems in Microelectronics-Photonics (1-3) (FA, SP, SU)** Opportunity for individual study of advanced subjects related to a graduate degree in Microelectronics-Photonics to suit individual requirements.

**MEPH 6801 Graduate Seminar (FA, SP, SU)** Papers presented by candidates for the Doctor of Philosophy degree in Microelectronics-Photonics on current research in the field of microelectronics-photonics. Prerequisite: graduate standing.

**MEPH 6811 Operations Seminar (FA, SP, SU)** Weekly seminar of Microelectronics-Photonics candidates for Doctor of Philosophy degree to discuss issues that impact a technical group's operational effectiveness. Topics to be discussed include ethics, applications of procedures, cultural impact on operations, and team based methodologies. Discussions of current events in the interaction between technology and human affairs will be included as appropriate. Prerequisite: graduate standing.

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## (MEST) MIDDLE EAST STUDIES

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**MEST4003 Middle East Studies Colloquium (FA, SP, SU)** An interdepartmental colloquium with an annual change in subject required of all students in the Middle East studies program. May be repeated for 6 hours. Prerequisite: sophomore standing.

**MEST4003H Honors Middle East Studies Honors Colloquium (FA, SP, SU)**

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## (MGMT) MANAGEMENT

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**MGMT1033 Introduction to Business (FA, SP)** Survey of organization, principles, practices of business world; provides general view of field as a whole, serves as foundation for specialized courses.

**MGMT3563 Management Concepts and Organizational Behavior (FA, SP, SU)** Introduces students to fundamental concepts of management practice with particular emphasis on managing human behavior in organizations. Addresses the planning, organizing, directing, and controlling functions performed by managers as these functions relate to managing human resources. Provides survey of critical management concepts; enables students to develop analytical and problem solving skills through case studies and experimental exercises.

**MGMT3633 Applied Managerial Problem Solving (FA, SP, SU)** Focuses on the knowledge and techniques needed to identify problems in the work situation and resolve them. Students develop the ability to use critical judgment to identify and solve problems faced by managers and organizations. In addition, students gain expertise to become discriminating and sophisticated consumers and users of business data and articles published in academic and practitioner-oriented journals. Prerequisite: MGMT 3563 and ISYS 2013.

**MGMT3643 Team Management (FA, SP, SU)** Focuses on the conceptual and behavior skills needed to manage teams in modern organizations. Students learn how teams are structured, how to observe and diagnose team functioning, and how to appropriately intervene to improve team performance. Course stresses the acquisition and

practice of specific communication and behavioral skills through the use of simulations and team projects. Prerequisite: MGMT 3563.

**MGMT3743 Human Resource Management (FA, SP)** Study of the human resource management function in the legal and organizational environment designed to benefit general human resource management and human resource specialists; emphasis given to development and administration of methods and policies within the legal context of contemporary human resource management. through the use of simulations and team projects. Prerequisite: MGMT 3563.

**MGMT3933 Entrepreneurship and New Venture Development (SP)** The role of the entrepreneur in starting up new businesses. Identification of new venture opportunities and the evaluation of their feasibility. Prerequisite: MGMT 3563.

**MGMT4003H Management Honors Colloquium (IR)** Explores events, concepts and/or new developments in the field of Management. May be repeated. Prerequisite: Senior standing.

**MGMT4103 Special Topics in Management (IR)** Explores trends, concepts, and important developments in management as they impact on organizational performance. Topics are selected by the Management Department faculty for each semester the course is offered. May be repeated. Prerequisite: completion of C.B.A. core.

**MGMT4203 Understanding Complex Organizations (FA)** Focuses on the internal functioning of complex organizations and on the organization-environment interface. Students are exposed to a variety of perspectives on the process of organizing, the differences among various forms of organizations, and the potential outcomes of organizing. Topics include organizational effectiveness, structures, environments, technologies and internal coordinating mechanisms, among others. Prerequisite: MGMT 3563.

**MGMT4333 Nonprofit Organizational Management (IR)** Environmental analysis, development of objectives for nonprofit and service organizations, evaluation and selection of alternative service methods, program development and implementation, and performance evaluation. Case studies, practical examples of management problems in government, educational, health care, professional and other nonprofit organizations. Prerequisite: MGMT 3563.

**MGMT4403 Total Quality Management (SP)** The management of quality as an organization-wide process, beginning with strong leadership by top management. Also includes strategic quality planning, employee empowerment, customer orientation, and data-based decision making. Competencies in these and other quality dimensions are developed in this course. Prerequisite: MGMT 3563.

**MGMT4433 Small Enterprise Management (FA)** Small enterprise opportunities and problems emphasizing innovation, management planning and control, financing, marketing and legal requirements. Emphasis on application of management knowledge to small enterprise management. Prerequisite: MGMT 3933.

**MGMT450V Independent Study (1-3) (FA, SP, SU)** Permits students on individual basis to explore selected topics in management. May be repeated for 3 hours.

**MGMT4533 Labor Legislation (IR)** Governmental approach to solution of labor problems; analyzes labor laws and their administration. Contract negotiations and arbitration procedures. Prerequisite: ECON 2013 and ECON 2023.

**MGMT4583 International Management (SP)** Develops an understanding of international business management and the cultural environments in which IB exists today. Students examine international business practices and learn about unique elements of business as it practiced in selected nations and diverse cultures. Prerequisite: MGMT 3563.

**MGMT4833 Strategic Management (FA, SP, SU)** This capstone course allows students to integrate the knowledge that they have acquired about the functioning of complex organizations. Focuses on top management's roles, responsibilities, and decision making in the processes of competitive environmental analysis, strategy implementation, strategic control, international strategic management, and ethical/socially responsible behavior. Prerequisite: senior status and completion of all junior level B.A. core courses.

**MGMT4833H Honors Strategic Management (FA, SP, SU)** This capstone course allows students to integrate the knowledge that they have acquired about the functioning of complex organizations. Focuses on top management's roles, responsibilities, and decision making in the processes of competitive environmental analysis, strategy implementation, strategic control, international strategic management, and ethical/socially responsible behavior. Prerequisite: senior status and completion of all junior level B.A. core courses.

**MGMT4943 Organizational Staffing (FA)** In-depth study of theoretical, legal, methodological, and substantive issues related to selection, performance appraisal, and development of employees. Student participates in individual and group projects designed to provide theoretical and practical skills related to staffing. Prerequisite: MGMT 3743.

**MGMT4953 Organizational Rewards and Compensation (SP)** Develops an understanding of reward systems theory and its application to the design of compensation systems. Provides theoretical and legal background and practical applications for the use of reward systems in attracting, motivating, and retaining employees. Prerequisite: MGMT 3743.

**MGMT4963H Honors Seminar I (FA)**

**MGMT4973H Honors Seminar II (SP)** Open to limited number of invited seniors; gives classroom experience in decision making through solution of policy and management problems. Prerequisite: invitation.

**MGMT4993 Entrepreneurship Practicum (FA, SP, SU)** Hands-on management of an actual on-going business. Students will gain experience working in, making decisions about, and managing a business. Topics covered include accounting, economics, finance, information systems, law, logistics, management, and marketing. Entrance by invitation. May be repeated for 6 hours.

**MGMT5203 Managerial Process and Organizational Behavior (FA, SP)** Acquaints students with administrative and management functions of planning, organizing, directing, and controlling. Special attention given to the impact of human subsystems in organization, organizational designs and structures, and organizational environments.

**MGMT5323 New Venture Development and Small Business Management (SU)** Identification and analysis of new venture opportunities, including the acquisition of resources. The role of the entrepreneur in developing and managing small business, including the development of entrepreneurial strategies and the analysis of growth opportunities.

**MGMT5343 Managerial Communication (FA, SP, SU)** Communication concepts and theories with emphasis on written and oral skill building. Students apply concepts and skills in a variety of communication contexts.

**MGMT5353 Multinational Management (FA)** Problems involved in multinational management of business firms; emphasis placed on environmental and organizational variables and the application of management concepts as they apply to international situations.

**MGMT5363 Strategic Innovation (SU)** Management of innovation and growth in organizations. Organization development processes, and the application of organizational change models such as intrapreneurship, innovation management, and total quality management.

**MGMT5383 Intra/Entrepreneurship of Technology (SP)** A multidisciplinary review of managing the development of new technical products and services in startups and in existing companies. The course includes examination of the search and evaluation for new technical products; development of business plans, resources, and prototypes; and managing the launch and business development of new products.

**MGMT5993 Entrepreneurship Practicum (FA, SP, SU)** 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 invitation only.

**MGMT6011 Graduate Colloquium (FA, SP)** Presentation and critique of research papers and proposals. May be repeated.

**MGMT6113 Seminar in Organizational Behavior (IR)** 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.

**MGMT6123 Seminar in Organization Theory (IR)** 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.

**MGMT6133 Seminar in Strategy Research (IR)** 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.

**MGMT6213 Seminar in Research Methods (IR)**  
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.

**MGMT6223 Seminar in Management Topics (IR)**  
Seminar in special research topics in management. Topics vary depending upon instructor. Prerequisite: admission to a Ph.D. program.

**MGMT6233 Seminar in Human Resource Management (IR)** 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.

**MGMT636V Special Problems in Management (1-6) (FA, SP)** Individual reading and research.

**MGMT700V Doctoral Dissertation (1-18) (FA, SP)**  
Prerequisite: candidacy.

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### (MILS) ARMY ROTC

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**MILS1001 Basic Outdoor Skills and Leadership Introduction (FA)** Incorporates various outdoor field craft skills involving both classroom and outdoor instruction. Subjects include, small group leadership, rappelling, basic map reading, water safety and first aid. Introduction to safe use of a rifle and basic marksmanship. Introduction to organization, values, and role of the Army. Classroom 1 hour per week. Lab 1 hour per week.

**MILS1000L Basic Outdoor Skills and Leadership Introduction Lab (FA)** Practical experience at leading and decision making is provided to all students. Labs include marksmanship, hiking, civil war battlefield visits, field leaders reaction course and varied outdoor activities. Corequisite: MILS 1001.

**MILS1011 Rappelling, Outdoor Field Craft and Leadership Development (SP)** Incorporates various outdoor field craft involving both classroom and outdoor instruction. Subjects include basic rappelling/mountaineering, intermediate map reading/ orienteering, first aid and outdoor cold/hot weather survival skills. Introduction to small group leadership principles. Classroom 1 hour per week. Lab 1 hour per week.

**MILS1010L Rappelling, Outdoor Field Craft and Leadership Laboratory (SP)** Practical experience at leading and decision making is provided to all students. Labs include rappelling/ orienteering, hiking, field leaders reaction course, whitewater rafting and varied outdoor activities. Corequisite: MILS 1011.

**MILS1101 Basic Rifle Marksmanship (FA)**  
Introduction to safe use of a rifle and practical application of rifle marksmanship. Course includes weapons safety, mechanics, capabilities, and fundamentals of marksmanship. Includes visit to fire at a local indoor rifle range. Materials and equipment furnished by Department of Military Science.

**MILS1211 Basic Outdoor Field Craft and Skills (FA, SP)** Introduction to basic military survival skills and outdoor field craft. Subjects include cold/hot weather survival, water procurement methods, plant identification, expedient field shelters, signaling, and rappelling/mountaineering. Materials and equipment furnished by Department of Military Science.

**MILS2002 Leadership Development I (FA)**  
Continuation of basic skills presented in MILS 1001 and MILS 1011. Course focus is on small unit leadership, team building and management skills. Includes an introduction to small unit tactics. Students develop leadership foundations by leading discussions, developing and briefing operation plans using the military decision making model. Classroom 2 hours per week. Lab 1 hour per week. Corequisite: MILS 2000L. Prerequisite: MILS 1001 and MILS 1011 or approval of Professor of Military Science.

**MILS2000L Leadership Development I Laboratory (FA)** Corequisite: MILS 2002.

**MILS2012 Leadership Development II (SP)**  
Continuation of leadership skills presented in MILS 2002. Course focus is on decision making process, time

management, and leadership skills. Includes an introduction to military writing and basic tactics. Cadets continue training in land navigation, first aid, and outdoor field craft. Classroom 2 hours per week. Lab 1 hour per week. Corequisite: MILS 2010L. Prerequisite: MILS 1001 and MILS 1011 or approval of Professor of Military Science.

**MILS2010L Leadership Development II Laboratory (SP)** Corequisite: MILS 2012.

**MILS2101 Advanced Rifle Marksmanship (SP)**  
Course to teach students the fundamentals of Advanced Rifle Marksmanship. Class is conducted once a week with topics including: Air rifle, small bore firing, advanced practical exercises of different shooting positions and marksmanship competition with other universities. Prerequisite: MILS 1101.

**MILS3004 Applied Leadership I (FA)** Development of managerial and leadership abilities, maximizing performance-oriented 'hands-on' training. Students learn advanced infantry tactics and demonstrate their leadership potential using this medium. Students are required to lead in drill and ceremony, physical training, and tactical infantry situations. The training is intended to prepare the student for the ROTC Advanced Camp experienced normally in the summer prior to the senior year or 4th year of ROTC. Lecture 3 hours, laboratory 3 hours per week, plus 3 hours of physical training are conducted weekly. One weekend field training exercise is required per semester. Corequisite: MILS 3000L. Prerequisite: junior standing plus one of the following conditions: completion of ROTC basic camp, veteran status, or completion of basic training with any component of the U.S. Armed Forces.

**MILS3000L Applied Leadership I Laboratory (FA)**  
Corequisite: MILS 3004.

**MILS3014 Applied Leadership II (SP)** Development of managerial and leadership abilities, maximizing performance-oriented 'hands-on' training. Students learn advanced infantry tactics and demonstrate their leadership potential using this medium. Students are required to lead in drill and ceremony, physical training, and tactical infantry situations. The training is intended to prepare the student for the ROTC Advanced Camp experienced normally in the summer prior to the senior year or 4th year of ROTC. Lecture 3 hours, laboratory 3 hours per week, plus 3 hours of physical training are conducted weekly. One weekend field training exercise is required per semester. Corequisite: MILS 3010L. Prerequisite: junior standing plus one of the following conditions: completion of ROTC basic camp, veteran status, or completion of basic training with any component of the U.S. Armed Forces.

**MILS3010L Applied Leadership II Laboratory (SP)**  
Corequisite: MILS 3014.

**MILS4004 Advanced Leadership I (FA)** The study of various military organizations and their role in military operations. Discussion of command and staff management in military organizations, executive responsibility of Army commissioned officers, service customs, courtesies, and traditions. The senior year includes the study of personnel management, professional ethics, the military justice system, and the Army's training and maintenance management system. Lecture 3 hours, laboratory 3 hours, physical training 3 hours per week. MS IV cadets plan and participate in 1 field training exercise per semester. Corequisite: MILS 4000L. Prerequisite: successful completion of MS III course work.

**MILS4001 Contemporary Military Issues (FA, SP)**  
Individual study for advanced undergraduates. Students will research, write a paper, and give an oral presentation of a current military issue. Prerequisite: PMS approval.

**MILS4000L Advanced Leadership I Laboratory (FA)** Corequisite: MILS 4004.

**MILS4014 Advanced Leadership II (SP)** The study of various military organizations and their role in military operations. Discussion of command and staff management in military organizations, executive responsibility of Army commissioned officers, service customs, courtesies, and traditions. The senior year includes the study of personnel management, professional ethics, the military justice system, and the Army's training and maintenance management system. Lecture 3 hours, laboratory 3 hours, physical training 3 hours per week. MS IV cadets plan and participate in 1 field training exercise per semester. Corequisite: MILS 4010L. Prerequisite: successful completion of MS III course work.

**MILS4011 Advanced Military Correspondence (FA, SP)** Practicum for advanced undergraduates. Students submit prepared military correspondence projects written in the military style using military forms and formats. Prerequisite: PMS approval.

**MILS4010L Advanced Leadership II Laboratory (SP)** Corequisite: MILS 4014.

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### (MKTL) MARKETING AND LOGISTICS

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**MKTT3433 Principles of Marketing (FA, SP, SU)**  
Distribution of manufactured goods, agricultural and natural products from producer to consumer; channels of trade, marketing functions, institutions, costs, problems, policies. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**MKTT3533 Promotional Strategy (FA, SP, SU)**  
Provides the student with the theory, knowledge, and application relevant to promotional strategy formation. Since promotion is the communication aspect of marketing, knowledge and skills pertinent to promotional planning, analysis, implementation, and evaluation will be emphasized specifically regarding advertising, personal selling, sales promotion, and publicity. Prerequisite: MKTT 3433.

**MKTT4003H Marketing and Transportation Honors Colloquium (IR)** Explores events, concepts and/or new developments in the field of Marketing and/or Transportation. Prerequisite: Senior standing.

**MKTT4033 Selling and Sales Management (FA, SP, SU)** Direction, supervision, control of sales divisions of manufacturing and wholesale organizations; sales planning, research, supervision, motivation and compensation of salespersons; principles and techniques of personal selling. Prerequisite: MKTT 3433.

**MKTT4103 Marketing Topics (FA, SP, SU)** Special topics in marketing not available in other courses. Topics are selected by the Marketing faculty for each semester each course is offered. May be repeated for 6 hours. Prerequisite: MKTT 3433.

**MKTT4133 Marketing Research (FA, SP, SU)**  
Modern research techniques applied to problems of measuring market and sales potentials, allocation of territories, demand for industrial goods, consumer purchasing power, sales forecasts; uses of products and sales research as basis for establishing marketing strategy. Prerequisite: MKTT 3433 and ISYS 2013.

**MKTT4533 Marketing Management (FA, SP, SU)**  
Strategic planning and management of the marketing function. Topics covered include product planning, channels strategy, pricing strategy, and promotional strategy in the context of the overall strategic direction of the firm. Prerequisite: MKTT 4133 and MKTT 4553.

**MKTT4553 Consumer Behavior (FA, SP, SU)**  
Analyzes consumer motivation, buying behavior, market adjustment, product innovation and adaptation; consumer market measurement, including survey of economic, behavioral science theories of consumer market behavior, producer and intermediary reactions. Consumer decision making is evaluated as to psychological drives, sociological concepts used by producers, channel intermediaries, consumers; considers methods, techniques for measuring consumer behavior, analyzing consumer markets. Prerequisite: MKTT 3433.

**MKTT4663 Industrial Marketing (IR)** Broad view of the marketing of industrial products, emphasizing the similarities and the differences between the marketing of industrial and consumer products. Marketing research, marketing policies, channels of distribution, product management, product pricing and promotion as they affect industrial products are examined. Prerequisite: MKTT 3433.

**MKTT4833 International Marketing (IR)** Studies overseas environmental forces; their impact on international marketing decision making; stresses marketing strategy development and problem solving in the international setting. Prerequisite: MKTT 3433.

**MKTT4933 Retail Marketing Strategy (FA, SP, SU)**  
Concentrates on planning to meet the objectives and satisfy the retail marketing concept. Attention is devoted to the retail strategy process, institutions of retailing, consumer behavior, retailing research, selection of a store location, the retail organizational structure, merchandise planning and management, communication with the customer, pricing, planning for service retailers, integrating and controlling the retailing strategy, and retailing trends. Prerequisite: MKTT 3433.

**MKTT4943 Retail Buying and Merchandise Control (FA, SP)** Duties, problems of store buyer, merchandise manager, demand forecasting, sources of buying information; analysis of records as aids to merchandise control; evaluation of resources; buying policies and practices; buyer as department manager; budgeting problems. Prerequisite: MKTT 3433.

**MKTT5313 International Marketing (IR)** Studies overseas environmental forces; their impact on international marketing decision making; stresses marketing problem solving in the international setting.



**MKTT5333 Retailing Strategy and Processes (SU)**  
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.

**MKTT5433 Consumer and Market Research (SP)**  
Modern marketing research techniques and their applications to problems related to marketing strategy, pricing, forecasting, and policy determination. Special attention is given to consumer research, behavioral concepts, and the measurement for marketing purposes. Prerequisite: ISYS 5203.

**MKTT5533 Strategic Category Management (SU)**  
Strategic planning and management of brands and product categories from both manufacturing and retailing perspectives. Focus is on the product brand development, pricing, distribution, and promotion of brands and their strategic and functional roles in the product mix.

**MKTT5553 Buyer Behavior (FA)** Behavioral science concepts, applied research relating to consumer and executive purchasing processes; stresses problems in buyer behavior research, conceptual integration, relevance to marketing management. Prerequisite: MKTT 5103.

**MKTT636V Special Problems in Marketing (1-6) (IR)** Individual research problems.

**MKTT6413 Special Topics in Marketing (IR)**  
Seminar in special topics in marketing. Topics vary depending upon the instructor.

**MKTT6423 Seminar in Causal Marketing (IR)**

**MKTT6433 Seminar in Research Methods (IR)**  
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.

**MKTT6443 Seminar in Marketing Theory (SP)**  
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. Prerequisite: MKTT 5103 and MKTT 5303.

**MKTT6453 Seminar in Transportation and Business Logistics (IR)** Underlying theories and problems related to the development of logistical systems in the U.S. Attention focused on transport economics, the role of government in providing transportation facilities, and managerial issues related to integrating transportation, inventory control, warehousing, customer service levels, and facility location.

**MKTT6463 Seminar in Strategic Marketing Management (IR)** Comprehensive survey of literature of strategic marketing management area. Focuses on critical evaluation of conceptual frameworks, research methodologies, and interdisciplinary integrations. Requires in-depth research, synthesis, integration, and conceptualization resulting in a research paper aimed at advancing the field of strategic marketing management. Prerequisite: MKTT 5303.

**MKTT700V Doctoral Dissertation (1-18) (FA, SP)**  
Prerequisite: candidacy.

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### (MLIT) MUSIC LITERATURE

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**MLIT1003 Basic Course in the Arts: Music Lecture (FA, SP, SU)** Introduction to music. Lecture 3 hours per week providing experience in guided listening. Acquisition of vocabulary and certain fundamentals of music.

**MLIT1003H Honors Music Lecture (FA, SP, SU)**

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### (MUAC) MUSIC CLASS

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**MUAC1121 Italian for Singers (FA, SP, SU)** Training in proper pronunciation and inflections of Italian as applied to singers. Two meetings per week.

**MUAC1141 German for Singers (FA, SP, SU)**  
Training in proper pronunciation and inflection of German as applied to singing. Two meetings per week.

**MUAC1151 French for Singers (FA, SP, SU)**  
Training in proper pronunciation and inflections of French as applied to singing. Two meetings per week.

**MUAC1161 Class Instruction in Piano for Non-Music Majors (FA, SP)** Beginning instruction in piano. Does not fulfill the class piano requirement for music majors.

**MUAC1221 Piano Class for Music Majors I (FA)**

Training in functional piano skills for music majors. Two meetings per week.

**MUAC1231 Piano Class for Music Majors II (SP)** A continuation of MUAC 1221. Two meetings per week. Prerequisite: MUAC 1221.

**MUAC1301 Class Instruction in Violin and Viola (FA, SP)** Beginning class instruction in violin and viola.

**MUAC1311 Class Instruction in Violoncello and String Bass (FA, SP)** Beginning class instruction in violoncello and string bass.

**MUAC1321 Class Instruction in Guitar (FA, SP)**  
Beginning class instruction in guitar. Students must provide their own instruments.

**MUAC1331 Class Instruction in Clarinet (FA, SP)**  
The elementary study of clarinet. Beginning class instruction designed to familiarize the student with the basic playing skills and teaching techniques for the instrument.

**MUAC1341 Class Instruction in Flute (FA, SP)** The elementary study of flute. Beginning class instruction designed to familiarize the student with basic playing skills and teaching techniques of the instrument.

**MUAC1351 Class Instruction in High Brass Instruments (FA, SP)** The elementary study of the cornet, trumpet, and horn. Beginning class instruction designed to familiarize the student with the history, physics, basic playing skills, methods, materials, and teaching techniques of the high brass family.

**MUAC1361 Class Instruction in Low Brass Instruments (FA, SP)** The elementary study of the trombone, euphonium and tuba. Beginning class instruction designed to familiarize the student with the history, physics, basic playing skills, methods, materials, and teaching techniques of the low brass family.

**MUAC1371 Teaching the Beginning Percussionist (FA, SP)** A study of the pedagogy and techniques needed to instruct middle school and junior high percussionists. Emphasis on elementary snare drum and marimba performance. Study of junior high band and orchestra methods, solos and ensemble music.

**MUAC1381 Class Instruction in Voice (FA, SP)**  
Fundamentals of vocalization and singing of English songs, including breathing, vowel clarity, and pronunciation of consonants.

**MUAC2111 Music Technology I (FA, SP, SU)**  
Students will develop skills in transcribing music using music notation software and learn about sound reinforcement systems. Prerequisite: MUAC 1231.

**MUAC2121 Music Technology II (FA, SP, SU)**  
Students will learn how to use MIDI sequencing and audio recording and editing software to produce accompaniment tracks and create compact discs of music and multimedia projects. Prerequisite: MUAC 1231.

**MUAC2141 Class Instruction in Oboe, Bassoon, and Saxophone (FA, SP)** The elementary study of oboe, bassoon, and saxophone. Class instruction designed to familiarize the student with basic playing skills and teaching techniques of the instruments. Prerequisite: MUAC 1331 or MUAC 1341.

**MUAC2221 Piano Class for Music Majors III (FA)**  
A continuation of MUAC 1231. Two meetings per week. Prerequisite: MUAC 1231.

**MUAC2231 Piano Class for Music Major IV (SP)** A continuation of MUAC 2221. Two meetings per week. Prerequisite: MUAC 2221.

**MUAC4371 Teaching the High School Percussionist (SP, Odd years)** 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 perc. ensemble scores. Prerequisite: MUAC 1371.

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### (MUAP) MUSIC PRIVATE

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**MUAP1001 Applied Voice/Instrument-Secondary Level (FA, SP, SU)** Private study at the secondary level. May be repeated.

**MUAP110V Applied Voice/Instrument (1-4) (FA, SP, SU)** Private study of the major instrument. May be repeated.

**MUAP3001 Applied Voice/Instrument-Secondary Level (FA, SP, SU)** Private study at the secondary level. May be repeated. Prerequisite: MUAP 1001.

**MUAP310V Applied Voice/Instrument (1-4) (FA, SP, SU)** Private study of the major instrument. May be repeated. Prerequisite: MUAP 110.

**MUAP310VH Honors Applied Voice/Instrument (1-18) (FA, SP, SU)** Private study of the major instrument. May be repeated.

**MUAP3201 Recital I (FA, SP, SU)** Preparation and performance of a public recital of a minimum of 25 minutes of music. May be repeated.

**MUAP3201H Honors Applied Recital I (FA, SP, SU)**  
Preparation and performance of a public recital of a minimum of 50 minutes of music. May be repeated. Corequisite: MUAP 310 H.

**MUAP4201 Recital II (FA, SP, SU)** Preparation and performance of a public recital of a minimum of 50 minutes of music. May be repeated.

**MUAP4201H Honors Applied Recital II (FA, SP, SU)** Preparation and performance of a public recital of a minimum of 50 minutes of music. May be repeated. Corequisite: MUAP 310 H.

**MUAP5001 Applied Voice/Instrument-Secondary Level (FA, SP, SU)** Private study at the graduate secondary level. May be repeated.

**MUAP510V Applied Voice/Instrument (1-5) (FA, SP, SU)** Private study at the graduate level. May be repeated. Prerequisite: MUAP 310 or equivalent.

**MUAP5201 Graduate Recital I (FA, SP, SU)**  
Preparation and performance of a public recital of a minimum of 50 minutes of music. May be repeated.

**MUAP5211 Graduate Recital II (FA, SP, SU)**  
Preparation and performance of a public recital of a minimum of 50 minutes of music. May be repeated.

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### (MUED) MUSIC EDUCATION

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**MUED3021 Supervised Practicum in Teaching Musical Skills (FA, SP, SU)** Provides for supervised teaching opportunities with public school students in instrumental, choral, and elementary classes. Prerequisite: instrumental emphasis (band): MUAC 1221 & MUAC 1231, MUAC 1331, MUAC 1341, MUAC 1351, MUAC 1361 & MUAC 1371, prerequisite for instrumental emphasis (string): MUAC 1221 & MUAC 1231, MUAC 1301, MUAC 1311 and any other three of those listed for "band" concentration, prerequisites for vocal (elementary) emphasis: MUAC 1221 & MUAC 1231 and any four of those listed for "band" or "string" concentration. MUAC 1321 may also count toward this requirement.

**MUED3813 Music for Elementary Education Majors (FA, SP, SU)** Develops music knowledge, skills, and pedagogical techniques for use in the elementary classroom. Lecture 3 hours, keyboard laboratory 1 hour per week. Prerequisite: MUAC 1161.

**MUED3810L Music for Elementary Education Majors Laboratory (FA, SP, SU)**

**MUED3833 Music Education in the Elementary School (FA, SP, SU)** Concepts of elementary music education; methods, materials, curriculum design, and supervision in elementary school music.

**MUED4031 Seminar for Professional Entry into Music Education (FA, SP)** A seminar offered during student teaching semester to prepare the student for the role of a professional educator. Content includes professional ethics and conduct, classroom management, evaluation and grading, and application for employment.

**MUED4273 Methods for Teaching String Instruments (FA, Odd years)** Methods and materials for students preparing to teach orchestral instruments and ensembles in the public schools.

**MUED4283 Teaching Vocal Music (FA, SP, SU, Even years)** Methods and materials used in teaching high school music.

**MUED4293 Instrumental Methods (FA)** Problems of teaching instrumental music in the public schools.

**MUED451V Student Teaching: Elementary Music (4-8) (FA, SP, SU)** A minimum of five weeks and a maximum of ten weeks will be spent in an off-campus school, where the student will teach under supervision in the elementary classroom and will participate in other activities involving the school and community. Enrollment requirement is for a total of 12 hours and 15 weeks involvement in 452V and 451V. Corequisite: MUED 452. Prerequisite: Bachelor of Music degree in Music Education.



**MUED452V Student Teaching: Secondary Music (4-8)** (FA, SP, SU) A minimum of five weeks and a maximum of ten weeks will be spent in an off-campus school, where the student will teach under supervision in the elementary classroom and will participate in other activities involving the school and community. Enrollment requirement is for a total of 12 hours and 15 weeks involvement in 452V and 451V. Corequisite: MUED 451. Prerequisite: Bachelor of Music degree in Music Education.

**MUED477V Special Topics in Music Education (1-4)** (IR) Subject matter not covered in other sources. With permission, may be repeated for credit if topics are different. May be repeated.

**MUED5513 Seminar: Resources in Music Education** (FA, SP, SU) 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 that synthesizes the research. Open to graduate students and undergraduates in honors in music education.

**MUED5653 Seminar: Issues in Music Education** (FA, SP, SU) 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.

**MUED5733 Music Education in the Elementary School** (FA, SP, SU) Concepts of elementary music education; methods, materials, curriculum design, and supervision in the elementary school music.

**MUED5811 Curriculum Design in Music** (FA, SP, SU) Goals and objectives in music education. Student will develop a curriculum for an actual or hypothetical music education program.

**MUED583V Workshop: Music in the Elementary School (1-3)** (FA, SP, SU) An in-service training workshop for elementary music teachers.

**MUED5862 Marching Band Techniques** (SU) Includes the place of the marching band in the school program, types of formations used, and selecting, arranging or writing the musical score.

**MUED588V The Choral Program: Changing Materials and Techniques (1-3)** (FA, SP, SU) Treatment of specific problems and issues—survey of choral literature; materials and contemporary methods appropriate to the development of a comprehensive choral experience.

**MUED599V Seminar (1-6)** (SU)

**MUED600V Master's Thesis (1-6)** (IR) Preparation of a master's thesis as partial fulfillment of the requirement for the master's degree.

**MUED605V Independent Study (1-6)** (FA, SP, SU) Provides students with an opportunity to pursue special study of problems in music education.

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### (MUEN) MUSIC ENSEMBLE

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**MUEN3341 Collegium Musicum** (FA, SP) Performance of early music various combinations of instruments and/or voices. Two hours rehearsal weekly. May be repeated.

**MUEN3401 Opera Theatre** (FA, SP) Study of opera through performances of scenes, chamber and major operatic production. Admission with director's approval. May be repeated.

**MUEN3411 Concert Choir** (FA, SP, SU) Three hours of rehearsal weekly, with extra rehearsals at the director's discretion. Admission with director's approval. No audition required prior to registration. May be repeated.

**MUEN3421 Inspirational Singers** (FA, SP) Performance of African-American literature with particular emphasis on Negro Spirituals and traditional/contemporary gospel music. No audition required to registration. Rehearsal 3 hours per week. May be repeated.

**MUEN3431 Symphony Orchestra** (FA, SP, SU) Rehearsal 3 hours per week with extra rehearsals at director's discretion. Admission with director's approval. May be repeated.

**MUEN3430L Symphony Orchestra Laboratory** (FA, SP, SU) May be repeated.

**MUEN3441 Marching Band** (FA) Rehearsal 8 hours per week. Admission with director's approval. May be repeated.

**MUEN3451 Schola Cantorum** (FA, SP) Vocal

ensemble limited to the more experienced singers. Rehearsal 5 hours per week. Admission with director's approval. May be repeated. Prerequisite: MUEN 3411.

**MUEN3461 Wind Symphony** (FA) Rehearsal 3 to 5 hours per week. Admission by audition and approval of the conductor. May be repeated. Corequisite: MUEN 3460L.

**MUEN3460L Wind Symphony Laboratory** (FA) May be repeated. Corequisite: MUEN 3461.

**MUEN3471 Jazz Performance Laboratory** (FA, SP) Training in the various styles of jazz and popular music. Rehearsal 3 hours per week. Admission by audition. May be repeated.

**MUEN3481 Concert Band** (SP) Rehearsal 3 hours per week. Admission by audition and approval of the conductor. May be repeated.

**MUEN3501 Chamber Music** (FA, SP, SU)

Performance of small ensemble music for any combination of instruments and/or voice. Rehearsal 3 hours per week. May be repeated.

**MUEN3511 Symphonic Band** (SP) Rehearsal 3 hours per week. Admission by audition and approval of the conductor. May be repeated.

**MUEN3521 Woodwind Quintet** (FA, SP) 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. May be repeated.

**MUEN3531 Brass Ensemble** (FA, SP) Study and performance of chamber music for brass instruments. Rehearsal 2 hours per week. May be repeated.

**MUEN3541 Accompanying** (FA, SP) Piano accompanying of vocal and instrumental soloists. Rehearsal 2 hours per week. May be repeated. Prerequisite: MUAP 110.

**MUEN3551 Percussion Ensemble** (SP, SU) Study and performance of ensemble music for multiple percussion instruments. Rehearsal 2 hours per week. May be repeated.

**MUEN3581 Vocal Ensemble** (FA, SP, SU) Study and performance of vocal chamber music. Rehearsal 2 hours per week for 1 hour of credit. May be repeated.

**MUEN3591 Chamber Orchestra** (FA, SP, SU) Performance of orchestral music for a small group of instruments as opposed to large symphonic works. Rehearsal 3 hours per week. May be repeated. Prerequisite: concurrent enrollment in MUEN 3431 and MUEN 5431.

**MUEN3711 Flute Ensemble** (FA, SP) Study and performance of music for multiple flutes, including trios, quartets, quintets, and clarinet choir. Rehearsal 2 hours per week. May be repeated.

**MUEN3721 Clarinet Ensemble** (FA, SP) Study and performance of music for multiple clarinets, including trios, quartets, quintets, and clarinet choir. Rehearsal 2 hours per week. May be repeated.

**MUEN3731 Saxophone Ensemble** (FA, SP) Study and performance of music for multiple saxophones, including trios, quartets, quintets, and saxophone choir. Rehearsal 2 hours per week. May be repeated.

**MUEN3741 Double Reed Ensemble** (FA, SP) Study and performance of music for multiple double reed instruments, including trios, quartets, quintets, and double reed choir. Rehearsal 2 hours per week. May be repeated.

**MUEN3751 Trumpet Ensemble** (FA, SP) Study and performance of music for multiple trumpets, including trios, quartets, quintets, and trumpet choir. Rehearsal 2 hours per week. May be repeated.

**MUEN3771 Trombone Ensemble** (FA, SP) Study and performance of music for multiple trombones, including trios, quartets, quintets, and trombone choir. Rehearsal 2 hours per week. May be repeated.

**MUEN3781 Tuba Ensemble** (FA, SP) 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. May be repeated.

**MUEN3791 University Bassoon Ensemble** (FA, SP) Study and performance of music for multiple bassoons and contrabassoon, including trios, quartets, quintets, and bassoon choir. One hour of rehearsal weekly. May be repeated.

**MUEN5341 Collegium Musicum** (FA, SP) Performance of early music for various combinations of instruments and/or voices. Rehearsal 2 hours per week. May be repeated.

**MUEN5401 Opera Theatre** (FA, SP) Study of opera through performances of scenes, chamber and major operatic production. Admission with director's approval. May be repeated.

**MUEN5411 Concert Choir** (FA, SP, SU) Rehearsal 3 hours per week with extra rehearsals at the director's discretion. Admission with director's approval. No audition required prior to registration. May be repeated.

**MUEN5421 Inspirational Singers** (FA, SP) Performance of African-American literature with particular emphasis on Negro Spirituals and traditional/contemporary gospel music. No audition required to registration. Rehearsal 3 hours per week. May be repeated.

**MUEN5431 Symphony Orchestra** (FA, SP, SU) Rehearsal 3 hours per week with extra rehearsals at director's discretion. Admission with director's approval. May be repeated.

**MUEN5441 Marching Band** (FA) Rehearsal 8 hours per week. Admission with director's approval. May be repeated.

**MUEN5451 Schola Cantorum** (FA, SP) Vocal ensemble limited to the more experienced singers. Rehearsal 5 hours per week. Admission with director's approval. May be repeated. Prerequisite: one year of MUEN 3411.

**MUEN5461 Wind Symphony** (FA, SP) Rehearsal 3 to 5 hours per week. Admission by audition and approval of the conductor. May be repeated. Corequisite: MUEN 5460L.

**MUEN5460L Wind Symphony Laboratory** (FA, SP) May be repeated. Corequisite: MUEN 5461.

**MUEN5471 Jazz Performance Laboratory** (FA, SP) Training in the various styles of jazz and popular music. Rehearsal 3 hours per week. Admission by audition. May be repeated.

**MUEN5481 Concert Band** (SP) Rehearsal 3 hours per week. Admission by audition and approval of the conductor. May be repeated.

**MUEN5501 Chamber Music** (FA, SP, SU) Performance of small ensemble music for any combination of instruments and/or voice. Rehearsal 3 hours per week. May be repeated.

**MUEN5511 Symphonic Band** (SP) Rehearsal 3 hours per week. Admission by audition and approval of the conductor. May be repeated.

**MUEN5521 Woodwind Quintet** (FA, SP) 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. May be repeated.

**MUEN5541 Accompanying** (FA, SP) Piano accompanying of vocal and instrumental soloists. Rehearsal 2 hours per week. May be repeated. Prerequisite: MUAP 110.

**MUEN5551 Percussion Ensemble** (SP, SU) Study and performance of ensemble music for multiple percussion instruments. Rehearsal 2 hours per week. May be repeated.

**MUEN5591 Chamber Orchestra** (FA, SP, SU) Performance of orchestral music for a small group of instruments as opposed to large symphonic works. Rehearsal 3 hours per week. May be repeated. Prerequisite: concurrent enrollment in MUEN 3431 and MUEN 5431.

**MUEN5711 Flute Ensemble** (FA, SP) Study and performance of music for multiple flutes, including trios, quartets, quintets, and clarinet choir. Rehearsal 2 hours per week. May be repeated.

**MUEN5721 Clarinet Ensemble** (FA, SP) Study and performance of music for multiple clarinets, including trios, quartets, quintets, and clarinet choir. Rehearsal 2 hours per week. May be repeated.

**MUEN5731 Saxophone Ensemble** (FA, SP) Study and performance of music for multiple saxophones, including trios, quartets, quintets, and saxophone choir. Rehearsal 2 hours per week. May be repeated.

**MUEN5741 Double Reed Ensemble** (FA, SP) Study and performance of music for multiple double reed instruments, including trios, quartets, quintets, and double reed choir. Rehearsal 2 hours per week. May be repeated.

**MUEN5771 Trombone Ensemble** (FA, SP) Study and performance of music for multiple trombones, including trios, quartets, quintets, and trombone choir. Rehearsal 2 hours per week. May be repeated.

**MUEN5781 Tuba Ensemble** (FA, SP) 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. May be repeated.

**MUEN5791 University Bassoon Ensemble** (FA, SP) Study and performance of music for multiple bassoons and contrabassoon, including trios, quartets, quintets, and bassoon choir. One hour of rehearsal weekly. May be repeated.

**(MUHS) MUSIC HISTORY**

**MUHS3703 History of Music to 1800 (SP)** Survey of history of music in western culture from ancient Greece to 1800. Lecture 3 hours, listening/quiz laboratory 1 hour per week. Prerequisite: WCIV 1003 and WCIV 1013 and MLIT 1003.

**MUHS3713 History of Music from 1800 to Present (FA)** Survey of the history of music in western culture from 1800 to present. Lecture 3 hours, listening/quiz laboratory 1 hour per week. Prerequisite: WCIV 1003 and WCIV 1013 and MLIT 1003.

**MUHS398VH Honors Independent Studies (1-2) (FA, SP, SU)** Independent projects in music history and literature. One hour credit per semester. Open to undergraduates in honors.

**MUHS4253 Special Topics in Music History (FA, SP)** Topics not covered in MUHS 3703 or 3713, including history of American music, world music, music of Russia, and others. Satisfactory completion of the term paper in this class will fulfill the Fulbright College writing requirement. May be repeated. Prerequisite: MUHS 3703 and MUHS 3713.

**MUHS4623 Music History Review (FA, SP, SU)** Review of the central data and concepts of music history, with emphasis on individual periods as needed by students enrolled. Credit in this course may not count toward the Master of Music or Master of Education degree.

**MUHS4703 Survey of String Literature (IR)** A survey of solo and chamber music literature involving stringed instruments. Prerequisite: MUAP 110 and MUTH 2613.

**MUHS4703H Honors Survey String Literature (IR)** A survey of solo and chamber music literature involving stringed instruments. Prerequisite: MUAP 110 and MUTH 2613.

**MUHS4733 Survey of Symphonic Literature (IR)** A survey of the symphonic literature from its beginning to the present.

**MUHS4763 Survey of Vocal Literature I (FA, SP, Odd years)** A survey of concert literature for the solo voice.

**MUHS4773 Survey of Vocal Literature II (FA, SP, Odd years)** A survey of concert literature for the solo voice. Prerequisite: MUHS 4763.

**MUHS4793 Band Literature (SP, SU, Even years)** 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).

**MUHS4803 Survey of Keyboard Literature I (FA, SP, Odd years)** A survey of the piano works of outstanding composers. Prerequisite: MUAP 110.

**MUHS4813 Survey of Keyboard Literature II (FA, SP, Odd years)** A survey of the piano works of outstanding composers. Prerequisite: MUHS 4803.

**MUHS4823 Survey of Organ Literature I (IR)** A survey of the organ works of outstanding composers. Prerequisite: MUAP 110.

**MUHS4833 Survey of Organ Literature II (IR)** A survey of the organ works of outstanding composers. Prerequisite: MUHS 4823.

**MUHS489V Seminar in Music History (1-4) (IR)** Subject matter not covered in other courses. With permission, may be repeated for credit if topics are different. May be repeated.

**MUHS4963H Honors Seminar in Performing Practice (IR)** Study of problems of performing in their historical context including media of performance: relation of notation to performance: rhythm: tempo: ornamentation: realization of improvised parts: dynamics and expression: and changing styles in music performance. Open to graduate students and to undergraduates in honors or consent of the instructor.

**MUHS498V Senior Thesis (1-6) (FA, SP, SU)**

**MUHS5722 Directed Studies in Music Literature I (FA, SP, SU)** Research in music literature in the performance field of the individual student.

**MUHS5732 Directed Studies in Music Literature II (FA, SP, SU)** Research in music literature in the performance field of the individual student. Prerequisite: MUHS 5722.

**MUHS5753 Seminar in Medieval & Early Renaissance (IR)** Intensive studies in music of Western Europe from early Christian times through the 15th century.

**MUHS5773 Seminar in Music of the 18th Century (FA, SP, SU, Odd years)** Intensive studies of late Baroque and Classical music.

**MUHS5783 Seminar in Music of the 19th Century (FA, SP, SU, Odd years)** Intensive studies in music of the 19th century.

**MUHS5793 Seminar in Music of the 20th Century (FA, Even years)** Intensive studies in 20th century music.

**MUHS5903 Seminar in Musicology (FA, SP, SU)** Current problems, techniques, and approaches to the practice of musicology, including notation and editing problems. May be repeated.

**MUHS5943 Seminar in Opera (FA, SP, SU)** Intensive studies in operatic literature.

**MUHS5952 Choral History and Literature I (FA, Odd years)** Detailed study of choral history and literature from Gregorian chant to J.S. Bach.

**MUHS5962 Choral History and Literature II (SP, Even years)** Detailed study of choral history and literature from J.S. Bach to the present.

**MUHS5973 Seminar in Bibliography and Methods of Research (FA, SP, SU)** 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.

**MUHS600V Master's Thesis (1-6) (FA, SP, SU)**

**MUHS601V Lecture-Recital (1-6) (IR)** The production and presentation, under the direction of the teacher(s) of historic instruments involved and other members of a graduate committee, of a performance (45 minutes minimum playing time) displaying historic practices of performance, with lecture. The candidate will be responsible for making archival tape of the performance available to the library, with 2 copies of a transcript of the lecture in thesis form to be retained by the University library.

**(MUPD) MUSIC PEDAGOGY**

**MUPD3801 Conducting I (FA)** A study of the elementary techniques of conducting instrumental and choral groups. Prerequisite: MUTH 2603.

**MUPD3811 Conducting II: Instrumental Music (SP)** Continuation of study of the technique of conducting instrumental music groups. Prerequisite: MUPD 3801.

**MUPD3861 Conducting II: Vocal Music (SP)** Continuation of study of conducting with emphasis on techniques of choral conducting. Prerequisite: MUPD 3801.

**MUPD3871 Reed-Making (FA)** The making of reeds for oboe, bassoon, or clarinet, including the processing of cane from tubes. May be repeated for 2 hours.

**MUPD477V Special Topics in Pedagogy (1-4) (IR)** Subject matter not covered in other sources. With permission, may be repeated for credit if topics are different. May be repeated.

**MUPD4781L Harpsichord Laboratory (IR)** The tuning, care and repair of the harpsichord.

**MUPD481V Conducting (1-4) (FA, SP, SU)** Private lessons of 1/2 hour, and one hour conducting laboratory each week. Development of skills in conducting symphony, opera, oratorio, ballet and band repertoire. May be repeated.

**MUPD4842 Piano Pedagogy I (FA, Odd years)** Analytical study and discussion of the various approaches to piano technique and their application. Involves demonstration of principles through actual teaching of intermediate and upper level students.

**MUPD4852 Piano Pedagogy II (SP, Even years)** Continuation of MUPD 4842. Prerequisite: MUPD 4842.

**MUPD499V Special Workshop in Music (1-2) (FA, SP, SU)** Presented by visiting master artist-teachers in various fields of music performance, teaching and composition. For this level it is expected that the prospective students are professionals in the given field seeking additional knowledge and insights from acknowledged professionals.

**MUPD5202 Voice Pedagogy I (FA, SP, SU)** Graduate-level study of the techniques and materials of teaching voice.

**MUPD582V Conducting (1-2) (FA, SP, SU)** 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.

**MUPD584V Opera Workshop Techniques (1-2) (FA, SP, SU)** A basic course in every phase of opera

production, including staging, set design, music coaching, voice casting, and translation.

**MUPD585V String Techniques (1-2) (FA, SP, SU)** A continuation of the undergraduate courses in techniques and materials for elementary and secondary school music teaching.

**MUPD586V Woodwind Techniques (1-2) (FA, SP, SU)** A continuation of the undergraduate courses in techniques and materials for elementary and secondary school music teaching. Prerequisite: one year of similar class instruction in the field on the undergraduate level.

**MUPD587V Brass Techniques (1-2) (SU)** A continuation of the undergraduate class brass instrument course. Emphasis is placed on teaching methods, techniques, concepts, and materials. Prerequisite: one year of similar class instruction in the field on the undergraduate level.

**MUPD591V Percussion Techniques (1-2) (FA, SP, SU)** A continuation of the undergraduate class brass instrument course. Emphasis is placed on teaching methods, techniques, concepts, and materials. Prerequisite: one year of similar class instruction in the field on the undergraduate level.

**MUPD599V Special Workshop in Music (1-6) (FA, SP, SU)** Presented by visiting master artist-teacher in various fields of music performance, teaching and composition. Prerequisite: graduate standing.

**(MUSC) MUSIC**

**MUSC4903H Honors Essay (IR)** An honors research paper in Music History or literature, Music Theory, or Music Education. Open to seniors in honors.

**(MUSY) MUSICOLOGY**

**MUSY5113 Proseminar: Ethnomusicology (FA, Odd years)** An introduction to ethnomusicological study with practicum in technologies for fieldwork, preservation and presentation.

**MUSY5123 Proseminar: Musical Notations, Transnotation and Analysis (SP, Even years)** Principles and practices for the study and musical analysis of gestural, oral, and written notations for music and dance.

**MUSY5213 Proseminar: Historical Ethnomusicology (FA, Even years)** An introduction to historical ethnomusicological study with readings and discussion of seminal writings in the field.

**MUSY5223 Seminar: Latin American Music (SP, Even years)** A study of the process and result of musical hybridization in South America and the Caribbean, from European colonization to the present.

**MUSY5313 Proseminar: Topics in Asian and Middle Eastern Musics (SP)** Research seminars on selected topics, such as The Performing Arts in East Asia; and Music and Ritual. May be repeated.

**MUSY5323 Seminar: Topics in Asian and Middle Eastern Poetry and Music (IR)** 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. May be repeated.

**MUSY5343 Seminar: Special Topics in Traditional Musics and Dance of Europe and the Americas (IR)** Topics not covered in MUSY 5223 and MUSY 5423, including, but not limited to: European Folk Music; the musical or scholarly legacy of a particular figure.

**MUSY5353 Seminar: Topics in Systematic Musicology (IR)** Seminars on selected topics such as Musical and A-musical Grammars (requires experience in functional programming languages); and Modes, Melodies, Instruments, and Singers. May be repeated.

**MUSY5363 Proseminar: Music Cognition (SP)** An exploration of recent literature concerning the mental mechanisms that underlie our ability to perceive, understand, produce, perform, and enjoy music. Introductory in nature, with readings drawn from the fields of psychology, philosophy, musicology, computer science, and neuroscience.

**MUSY5371 Early Asian Music Performance Workshop (IR)** Approaches to performing early Asian musics. Links with Summer School, the Ancient Asian Music Consort, and/or an Artist in Residence.

**MUSY5383 Ethnomusicology Summer Fieldwork (IR)** A minimum of 6 weeks summer fieldwork related to the topic of the student's thesis, resulting in an extensive



fieldwork report and the submission of collected material, to be deposited in the University Library. Prerequisite: MUSY 5113.

**MUSY5391 Ethnomusicology Performance Studies (IR)** Applied vocal or instrumental studies relating to the performance activities of the International Center for Research in Early Asian and Middle Eastern Musics. (Private study, as available)

**MUSY5413 Proseminar: Cross-cultural Performance Practices (SP)** A survey of performance practices from historic western art music through modern non-western music. An introductory course with readings from seventeenth- and eighteenth-century performance treatises as well as a study of written and aural traditions of non-western music.

**MUSY5423 Seminar: History of Jazz (FA)** A study of the musical and cultural cross-fertilization that produced this influential twentieth-century art form, as well as a general examination of its major practitioners.

**MUSY600V Ethnomusicology Thesis (1-6) (FA, SP, SU)** Thesis requirement for the Master of Arts in Ethnomusicology program.

**MUSY6313 Internship in Asian and Middle Eastern Music (FA, SP, SU)** Internship in Asian and Middle Eastern Music Preservation in the Asian and Middle Eastern International Music Preservation Collection, Music Division of the Library of Congress. Prerequisite: MUHS 5973 and (MUSY 5123 or MUSY 5353).

**MUSY6333 Advanced studies in Ethnomusicology (IR)** Advanced level studies, individually tailored and supervised, including Ethnomusicology (prerequisite MUSY 5113 or MUSY 5213); The Music or Dance of a Selected Area (prerequisite at least one of MUSY 5313, MUSY 5323, MUSY 5423, MUSY 5223, MUSY 5343, or HUMN 4243); Historic Performance Practices (prerequisite MUSY 5413); Historical East Asian Musicology (prerequisite MUSY 5313 or MUSY 5323); and Historical Central Asian or Middle- and Near-Eastern Musicology (prerequisite MUSY 5313 or MUSY 5323).

**MUSY6363 Advanced Studies in Computer-Aided Asian Musicology (IR)** Building a computational toolbox for research in early Asian musics. Prerequisite: MUSY 5353.

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## (MUTH) MUSIC THEORY

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**MUTH1003 Basic Musicianship (SU)** Introductory-level studies in music theory and aural perception for students not prepared for MUTH 1603 or MUTH 1621. Meets 4 days per week.

**MUTH1603 Music Theory I (SP)** A study of diatonic harmonic practice. Includes part-writing and analysis. Prerequisite: MUTH 1003.

**MUTH1621 Aural Perception I (SP)** Development of aural perception through ear training, sight singing, and keyboard harmony. Meets 2 hours per week.

**MUTH1631 Aural Perception II (SP)** Continued development of aural perception through ear training, sight singing, and keyboard harmony. Meets 2 hours per week. Prerequisite: MUTH 1621.

**MUTH164V Composition (1-4) (FA, SP, SU)** 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. May be repeated. Prerequisite: MUTH 164.

**MUTH2603 Music Theory II (SP)** A continuation of MUTH 1603. Also includes chromatic harmony. Prerequisite: MUTH 1603.

**MUTH2621 Aural Perception III (SP)** A continuation of MUTH 1631. Two hours per week, one hour credit. Prerequisite: MUTH 1631.

**MUTH2631 Aural Perception IV (FA)** A continuation of MUTH 2621. Two hours per week, one hour credit. Prerequisite: MUTH 2621.

**MUTH3603 Music Theory III (SP)** A study of 18th century counterpoint. Writing and analysis of inventions, canons, fugues, etc. Three hours per week. Prerequisite: MUTH 2603.

**MUTH3613 Music Theory IV (FA)** A study of the harmonic and melodic trends of the 20th century. Three hours per week. Prerequisite: MUTH 3603.

**MUTH364V Composition (1-4) (FA, SP, SU)** 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. May be repeated. Prerequisite: MUTH 164.

**MUTH364VH Honors Composition II (1-4) (FA, SP, SU)** 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. May be repeated. May be repeated.

**MUTH398V Independent Studies, Honors (1-2) (FA, SP, SU)** Independent projects in music theory. One hour credit per semester. Open to undergraduate in honors.

**MUTH4612 Orchestration (FA)** 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. Prerequisite: MUTH 2613.

**MUTH462V Music Theory Review (1-3) (FA, SU)** A continuation and intensification of undergraduate music theory. (May not count for credit toward the Master of Music degree.)

**MUTH4633 MIDI Applications in Music I (FA, SP)** MIDI Application music techniques and equipment, including their application in the composition of electronic computer music. Lecture 2 hours, laboratory 2 hours per week. Prerequisite: MUTH 2613.

**MUTH4692 Advanced Keyboard Techniques II (FA, SP)** A study of keyboard skills such as clef reading, score reading, transposing, and modulating. Prerequisite: MUTH 4682.

**MUTH4703 Form and Analysis (SP)** Beginning with phrase and period structure, a complete evaluation of musical form through large forms such as sonata, rondo, and theme and variation; with emphasis on characteristics of the classic and romantic schools, and analyses of select sonata movements. Prerequisite: MUTH 2613.

**MUTH477V Special Topics in Music Theory (1-4) (IR)** Subject matter not covered in other courses. May be repeated for 4 hours.

**MUTH498V Senior Thesis (1-18) (FA, SP, SU)**

**MUTH5322 Score Reading (IR)** 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.

**MUTH5343 Analytical Techniques (FA, Odd years)** 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 2613 or equivalent.

**MUTH5623 Pedagogy of Theory (FA, Even years)** Detailed study of methods of teaching undergraduates courses in music theory and aural perception.

**MUTH5631 Music Theory Teaching Practicum (IR)** Supervised teaching of an undergraduate course in music theory or aural perception, including lesson plan and examination preparation and in-class observation.

**MUTH5643 Analysis of 20th Century Music (FA, Even years)** Study of 20th century music and analytic techniques including pitch class set theory and serial techniques. Prerequisite: graduate standing.

**MUTH5662 Instrumental Arranging (SU)** A practical course in arranging for the various small ensembles including keyboard. Review of instrumental ranges and capabilities. Study of current trends in instrumental ranges and arranging.

**MUTH5672 Advanced Orchestration (IR)** A study of advanced principles of orchestral writing through individual projects in scoring and analysis. Prerequisite: MUTH 4612 or equivalent.

**MUTH568V Composition (1-4) (FA, SP, SU)** 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. May be repeated. Prerequisite: graduate standing.

**MUTH600V Master's Thesis (1-6) (FA, SP, SU)**

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## (NURS) NURSING

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**NURS217V Independent Study in Nursing (1-2) (FA, SP)** A selected learning experience in nursing to exchange knowledge about and/or practice in the profession. Objectives and experiences are designed on an individual basis with a faculty adviser.

**NURS3013 Computers in Health Care Systems**

(FA, SP, SU) Focuses on the use of computers in the health care system. Basic computer terminology, equipment, evaluation of software, and nursing applications are discussed. Prerequisite: for pre-nursing and nursing majors only.

**NURS3022 Introduction to Professional Nursing Concepts (SU)** (Formerly NURS 3023) The course presents an overview of theories, principles and concepts essential to professional nursing practice. It includes ethical and legal implications relevant to health care systems. Focus is on the nursing process as the organizing framework for the delivery of care. It also explores the role of the professional nurse. This is a Level I course. Prerequisite: admission into BSN professional program of studies.

**NURS3032 Therapeutic Communication (SU)** Focuses on intrapersonal and interpersonal strategies necessary for effective nurse-client interactions. Introduces a variety of communication techniques skills including group process and dynamics. This is a Level I course.

**NURS3042L Professional Nursing Skills: Basic (SU)** (Formerly NURS 3041L and NURS 3141L) Introduction to basic nursing. Students will apply basic skills in laboratory and clinical settings. This is a Level I course.

**NURS3133 Clinical Practicum: Nursing and Health Promotion (FA)** The clinical component to NUSP 3123. Allows student to apply knowledge and practice skills utilizing the nursing process. This is a Level I course. Corequisite: NURS 3123. Prerequisite: NURS 3023 and NURS 3032 and NURS 3041L.

**NURS3141L Technical Interventions in Nursing: Laboratory II (FA, SU)** The second campus laboratory experience in a sequence of 4 courses. Technical skills in nursing practice to meet basic health care needs of the client are presented. This is a Level I course. Prerequisite: NURS 3041L.

**NURS3212 Nursing Concepts: Teaching and Health Promotion (FA)** (Formerly NURS 3123) The course introduces principles of teaching/learning and the professional nurse's role in health promotion and disease prevention. The concept of health is explored throughout the lifespan in the context of spirituality, culture, relationships, nutrition, environment, exercise, and lifestyle behaviors. A variety of health education strategies are presented and evaluated. This is a Level I course. Corequisite: NURS 3221. Prerequisite: NURS 3022, NURS 3032, and NURS 3042L.

**NURS3221 Professional Role Implementation I: Teacher (FA)** The principles of teaching/learning and health promotion are enacted with selected clients in the community. This is a Level I course. Corequisite: NURS 3212. Prerequisite: NURS 3022 and NURS 3032.

**NURS3314 Pathophysiology (FA)** The course focuses on underlying concepts common to pathophysiological processes across the life span. Factors that contribute to altered physiological functioning and the body's adaptive and compensatory mechanisms are studied. Emphasizes understanding the rationale for preventive and therapeutic nursing interventions in health and illness. This is a Level I course. Prerequisite: admission into BSN professional program.

**NURS3312 Pharmacology in Nursing (FA)** The use of therapeutic drugs in health care is the focus of the course. Nursing assessment, safety measures and client education related to drug therapy are emphasized. This is a Level I course. Prerequisite: admission into the BSN professional program.

**NURS3321 Health Assessment (FA)** The course focuses on assessment of client's health status, environment, nursing care needs, and referral needs. The course presents concepts and skills necessary to perform a holistic health assessment of the adult client. This is a Level I course. Corequisite: NURS 3422 and NURS 3423. Prerequisite: admission to the BSN professional program.

**NURS3341L Technical Interventions in Nursing: Laboratory III (SP)** The 3rd campus laboratory experience in a sequence of 4 courses. Technical skills common to adult health nursing practice are presented. This is a Level II course. Corequisite: NURS 4123 and NURS 4133. Prerequisite: NURS 3141L.

**NURS3423 Professional Role Implementation II: Caregiver (FA)** Students apply basic nursing concepts and skills in laboratory and clinical settings. Emphasis is on the caregiver role and use of the nursing process. This is a Level I course. Corequisite: NURS 3422 and NURS 3321.

**NURS3422 Nursing Concepts: Foundations of Professional Practice (FA)** Introduction to the nursing process and the scope of basic human needs. The student learns to use nursing diagnoses and care plans in case studies. This is a Level I course. Corequisite: NURS 3423. Prerequisite: admission to BSN professional program.



**NURS3634 Nursing Concepts: Adult Health and Illness (SP)** (Formerly 4123) Focuses on health altered physiologic functioning in adults experiencing acute and chronic problems. Emphasis placed on pathophysiologic concepts essential for understanding the rationale for therapeutic nursing interventions in illness. The nursing process is used to assist adults meet health needs in structured settings. This is a Level II course. Corequisite: NURS 3643. Prerequisite: completion of Level I courses.

**NURS3643 Professional Role Implementation III: Caregiver (SP)** (Formerly NURS 4133) Emphasizes the role of caregiver in acute care settings. Course expands on assessment and clinical skills learned in previous courses. Emphasizes the use of clinical judgment to promote optimal health among adults experiencing illness and/or undergoing surgery. This is a Level II course. Corequisite: NURS 3634. Prerequisite: completion of Level I courses.

**NURS3742 Nursing Concepts: Mental Health and Illness (SP)** (Formerly NURS 4103) Presents the basic concepts and theories of mental health and illness. Examines various therapeutic modalities in the care of clients experiencing mental health or psychosocial disorders. This is a Level II course. Corequisite: NURS 3752. Prerequisite: completion of Level I courses.

**NURS3752 Professional Role Implementation IV: Caregiver (SP)** (Formerly NURS 4112) Students work with clients who have mental health problems, observe group process in therapy sessions, and develop interpersonal communication skills. Students apply research-based knowledge in assisting assigned clients meet mental and other health care needs. This is a Level II course. Corequisite: NURS 3742. Prerequisite: completion of Level I courses.

**NURS3842 Research in Nursing (SP)** (Formerly NURS 3343) Introduction to the research process through a comparative analysis of selected studies exemplifying various theoretical, methodological and analytical approaches. Students acquire the basic competencies to critically read, evaluate and interpret nursing research studies for use in professional nursing practice. This is a Level II course.

**NURS3841L Professional Nursing Skills: Advanced (SP)** (Formerly NURS 3341L) Introduction to advanced nursing skills. Students will apply advanced skills in laboratory and clinical settings. This is a Level II course. Prerequisite: completion of Level I courses.

**NURS4154 Nursing Concepts: Children and Family (FA)** (First Offered Fall 2002, Formerly NURS 4134) This course provides theory and research-based knowledge regarding holistic nursing care of children and families. Principles of health promotion and health education for expanding families are integral to this course. This is a Level II course. Corequisite: NURS 4164. Prerequisite: completion of Level I courses.

**NURS4164 Professional Role Implementation V: Teacher (FA)** (First Offered Fall 2002, Formerly NURS 4144) Clinical and laboratory experience for application of research-based knowledge and skills in the nursing care of children and families. Emphasis is on teaching role of the nurse. This is a Level II course. Corequisite: NURS 4154. Prerequisite: NURS 3841L and completion of Level I courses.

**NURS4242 Management in Nursing (FA)** (First Offered Fall 2002, Formerly NURS 3322) Introduces principles of management and the professional nurse's roles in the health care system. Considers the perspectives of management, organization, and change theory. Includes strategies for monitoring delivery of care, outcomes and evaluating program effectiveness. This is a Level II course.

**NURS4241L Technical Interventions in Nursing: Laboratory IV (FA)** The final campus laboratory experience in a sequence of 4 courses. Selected technical skills common to family and critical care nursing practice are presented. This is a Level II course. Corequisite: NURS 4134 and NURS 4144. Prerequisite: NURS 3341L.

**NURS4263 Nursing Concepts: Older Adult Health and Illness (FA)** (First Offered Fall 2002, Formerly NURS 4213) This course focuses on gerontologic theories, concepts, and principles as they relate to nursing care of older adults. Students explore socio-cultural context of gerontologic nursing, professional standards of practice, common health concerns, and future considerations. This is a Level II course. Corequisite: NURS 4273. Prerequisite: completion of Level I courses.

**NURS4273 Professional Role Implementation VI: Manager (FA)** (First Offered Fall 2002, Formerly NURS 4214) Students will apply the theoretical principles learned in NURS 4263 to the delivery of care to older adults in a variety of settings. The manager will be emphasized. This is a Level II course. Corequisite: NURS 4263. Prerequisite: NURS 3841L and completion of Level I courses. (SP) (SP)

**NURS4443 Nursing Concepts: Critical Care (SP)** (First Offered Spring 2003, Formerly NURS 4313) This course focuses on alterations in biopsychosocial function that necessitate admission to a critical care unit. A nursing framework is used to emphasize the nurse's role in clinical assessment, diagnosis, therapeutic management, and outcome evaluation. Nurse caregiver, teacher, and manager roles are synthesized. This is a Level II course. Corequisite: NURS 4453. Prerequisite: completion of Level I and II courses.

**NURS4453 Professional Role Implementation VII: Role Synthesis (SP)** (First Offered Fall 2002, Formerly NURS 4323) Focuses on role synthesis and research-based nursing practice to provide nursing care to critically ill clients. Students develop nursing skills and clinical judgment to assess, plan, implement and evaluate nursing care of critically ill clients. This is a Level III course. Corequisite: NURS 4443. Prerequisite: completion of Level I and II courses.

**NURS4603 Nursing Concepts: Communities (SP)** The course focuses on theories and concepts in community health nursing. Epidemiology, community assessment, systems of health care delivery, education, school health, public health, home health, industrial health, and health resources are explored in a community health context. This is a Level III course. Corequisite: NURS 4613. Prerequisite: completion of Level I and II courses.

**NURS4613 Professional Role Implementation VIII: Role Synthesis (SP)** Application of community health concepts and the nursing process to promote community health and to restore health in a variety of primary care settings. This is a Level III course. Corequisite: NURS 4603. Prerequisite: completion of Level I and II courses. (SP)

**NURS4712 Seminar in Nursing (SP) (First Offered Fall 2002, Formerly NURS 4713) Focuses on integrating the nursing caregiver, teacher and manager roles.**

**Prepares students to analyze practice issues, trends and future demands. Explores the roles of baccalaureate prepared professional nurses and facilitates students to incorporate those roles as they enter professional practice. This is a Level III course. Prerequisite: completion of Level I and II courses - taken last semester.**

**NURS491V Independent Study in Nursing (1-3) (FA, SP) A selected learning experience in nursing to enhance knowledge and/or practice of the profession. Objectives and experiences are designed on an individual basis with a faculty adviser. May be taken with any 3500-level nursing course or above.**

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## (OMGT) OPERATIONS MANAGEMENT

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**OMGT4223 Occupational Safety and Health Standards (SP)** Survey of existing and proposed standards by examining fundamental physical, economic, and legal bases. Performance vs. specific standards. Enforceability and data collection. National consensus and promulgation process. Includes a design project using a computer. Prerequisite: freshman physics and chemistry.

**OMGT4303 Industrial Safety Administration (FA, SP, SU)** Principles of accident and industrial disease prevention; organization and operation of industrial safety and hygiene programs; conformance with federal occupational safety and health regulations. For operations management students an alternative course in INEG 4223. Either course, but not both, can be used for credit toward the operations management degree.

**OMGT4313 Law and Ethics (FA, SP, SU)** Analysis of the fundamental legal principles applicable in protecting the rights and interests of individuals and organizations; court systems and litigation processes; constitutional law and legislation, formation and discharge of contracts; agency relationships; torts; labor laws; patents; trademarks; copyrights; unfair competition; ethics; professional relations. Not for graduate credit.

**OMGT4323 Industrial Cost Analysis (FA, SP, SU)** Use of accounting information for planning and control from a management viewpoint; principles of cost accounting and other aspects of production costs; budgeting, depreciation, taxes, distribution of profits, securities, sources of corporate capital, and interpretation of financial statements. Not for graduate credit.

**OMGT4333 Applied Statistics (FA, SP, SU)** Fundamentals of probability and distribution theory with applications in managerial decision making. Descriptive methods, probability distributions, sampling distributions and hypothesis testing are included. Not for graduate credit.

**OMGT4373 Quality Engineering and Management**

(IR) Provides the student with complete coverage of the functional area of "Quality Assurance"; ranging from the need for such a function, how it works, techniques utilized, and managerial approaches for insuring its effectiveness. Prerequisite: INEG 3313.

**OMGT4433 Administrative Analysis (FA)** Studies of cases in engineering administration emphasizing human relationships in a technical environment. Productivity/quality enhancement through an understanding of organizational design and behavior, motivation and reward systems, and participative management.

**OMGT4523 Automated Production (FA)** Industrial robots and robot programming, industrial logic control systems, programmable controllers for the control of work stations, and conveyor systems. On-line computer and microprocessors. Group technology, flexible manufacturing systems, and computer-integrated manufacturing laboratory required. Prerequisite: INEG 3513 or equivalent experience.

**OMGT4520L Automated Production Laboratory (FA)**

**OMGT4553 Production Planning and Control (SP)** Operational problems of production systems including control of purchased materials inventory; scheduling of a job shop, batch, and continuous production process for single and multi-item product lines; planning of work force and inventory under seasonal and stochastic demand.

**OMGT4583 Operations Productivity and Automation (FA, SP, SU)** An examination of methods to improve industrial productivity including quality circles, robots, machine vision, programmable controllers, computer numerical control, and computer-assisted manufacturing. For operations management students an alternative course is INEG 4523. Either course, but not both, can be used for credit toward the operations management degree.

**OMGT4613 Production and Inventory Control (FA, SP, SU)** Operational problems of production systems including control of purchased materials; scheduling of job shop, batch, and continuous production processes; planning of work force and production under seasonal demand. Inventory models and strategies are compared. For operations management students an alternative course is INEG 4553. Either course, but not both, can be used for credit toward the operations management degree.

**OMGT4623 Operations Analysis (FA, SP, SU)** Case studies covering the spectrum of strategic management issues facing typical organizations. Designed to provide analysis and synthesis experience to apply principles of operations management.

**OMGT4783 Project Analysis and Control (FA, SP, SU)** Introduction to the Critical Path Method and Program Evaluation and Review Technique. Project planning and control methods; activity sequencing; time-cost trade-offs; allocation of manpower and equipment resources; scheduling activities; computer systems for PERT/CPM.

**OMGT4853 Data Processing Systems (FA, SP, SU)** Fundamentals of computers and data processing. Computer hardware and software. Word processing and spreadsheet methods and applications. Introduction to database concepts and applications.

**OMGT4873 Principles of Operations Research (FA, SP, SU)** Surveys the mathematical models used to design and analyze operational systems. Contents include linear programming models, waiting line models, and management science. Applications of operations research are emphasized.

**OMGT5003 Introduction to Operations Management (FA, SP, SU)** An overview of the curriculum leading to the M.S. Degree with a major in Operations Management. Each class will consist of a capsule of the topics covered in other courses in depth. Guest lectures. Required course for all majors in Operations Management.

**OMGT5013 Operational Systems Design (FA, SP, SU)** Fundamental tools for design and analysis of operational systems. Facilities location and design, materials handling, transportation, maintenance, standards, and control.

**OMGT5113 Public Personnel Administration (FA, SP, SU)** Personnel policies and practices are compared for military, government, and private operations including legal foundations, classification and compensation plans, recruitment and selection processes, training, employment policies and morale, compensation, employee relations, and organization.

**OMGT5123 Public Financial Administration (FA, SP, SU)** Financial planning in military and civilian operations; the application of budgets and controls for operational systems.

**OMGT5133 Industrial Engineering in the Service**

**Sector (FA, SP, SU)** Review of the development of industrial engineering into the service sector, e.g., health care systems, banking, municipal services, utilities, and postal service. Emphasizes those principles and methodologies applicable to the solutions of problems within the service industries. Prerequisite: graduate standing.

**OMGT5143 Contemporary Issues in Human Resource Management (IR)** Emerging issues affecting employee well-being and workforce productivity. Impact of such issues as diversity, job evaluation, compensation, incentive pay, retention, and the aging workforce. Legal aspects of FMLA, EAP, and ADA are included. Students will develop a wage survey and an action plan to implement into an organization.

**OMGT5223 Safety and Health Standards Research (FA, SP, SU)** For graduate students who seek Certified Professional or Certified Industrial Hygienist status, or both. Includes review and development of computer databases for standards, interpretations, court decisions, and field memoranda. Test equipment and procedures for determining indoor industrial aid containment PEL concentrations and industrial environment noise levels are examined. Prerequisite: INEG 4223 or OMTG 4303.

**OMGT5303 Health Care Policies and Issues (IR)** Health care management and policy development. Health insurance, Medicare and managed care. Health benefits for employees. The role of government and business in policy formulation. Financing of health care. Legal and ethical considerations in health care. Hospital and outpatient management issues.

**OMGT5373 Total Quality Management (FA, SP, SU)** Implementation of modern participative quality management techniques in military and civilian operations. Includes quality control methods and control charts. Acceptance sampling plans with emphasis upon Department of Defense procurement standards. For operations management students in alternative course is INEG 4323. Either course, but not both, can be used for credit toward the operations management degree.

**OMGT5423 Engineering & Global Competition (SP)** Studies of principles and cases in engineering administration in global competition. Emphasis on high-technology manufacturing such as the electronic industry. 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 engineering practice. Prerequisite: INEG 4433.

**OMGT5433 Cost Estimation Models (FA, SP, SU)** An examination of the methodologies for estimating and forecasting manufacturing costs. Types of cost recovery systems, work progress functions, product improvement curves, determination of hourly rates, parametric estimating systems, and the development of software for computer-assisted estimating systems. Prerequisite: INEG 3513 and INEG 3833.

**OMGT5463 Economic Decision Making (FA, SP, SU)** Principles of engineering 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 project alternatives.

**OMGT5733 Human Factors Analysis (FA, SP, SU)** Psychological and physiological factors to be considered by the operations manager. Human perceptual and work capacities are examined in relation to various task situations, with emphasis on controlling and monitoring tasks. Fundamental design factors are also considered. Human behavioral aspects of management decisions are considered.

**OMGT577V Special Problems (1-3) (FA, SP, SU)** 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.

**OMGT5823 Computer Applications (FA, SP, SU)** Computer systems for analysis and control of operations management problems. Coding of operations models and currently available software systems. Microcomputers, minicomputers, and time-sharing systems. Networking and navigating the Internet as a resource for solving operations management problems.

**OMGT5873 Organization and Control (FA, SP, SU)** Examination of organizational decision making authority, structures, and controls. Functions of management-planning, organizing, staffing, directing, and controlling. Comparison of military and civilian environments for the implementation of management principles.

## (PADM) PUBLIC ADMINISTRATION

**PADM5803 Quantitative Methods Analysis (FA)** Data analysis techniques, including descriptive and inferential statistics and packaged computer programs. Prerequisite: (Appropriate undergraduate statistics course or equivalent) and graduate standing.

**PADM5813 Methods in Public Management Information (SP)** Quantitative approaches toward an understanding of public administration and statistical tools for analysis of administrative problems and programs. Prerequisite: PADM 5803 or equivalent and graduate standing.

**PADM5823 Grantwriting for the Social Sciences (IR)** This course will teach students the fundamentals of obtaining grants from local, state and federal agencies.

**PADM584V Special Topics in Public Administration (1-3) (IR)** Topic varies. May be repeated for 6 hours.

**PADM587V Internship in Public Administration (1-6) (FA, SP, SU)**

**PADM588V Directed Readings (1-3) (FA, SP, SU)** Prerequisite: graduate standing.

**PADM589V Independent Research (1-3) (FA, SP, SU)** Prerequisite: graduate standing.

## (PEAC) PHYSICAL EDUCATION/ACTIVITY

**PEAC1111 Adaptive Activities (FA, SP)** Instruction and participation in sports, recreational and fitness type activities.

**PEAC1121 Adaptive Activities (FA, SP)** Instruction and participation in sports, recreational and fitness type activities.

**PEAC1131 Beginning Swimming (FA, SP)** Includes: essentials of water safety; basic strokes and techniques of swimming; and beginning diving.

**PEAC1141 Aquatic Fitness (FA, SP)** Instruction and participation in various types of aerobic and strengthening water activities.

**PEAC1221 Beginning Jogging (FA, SP)** Instruction and participation in jogging.

**PEAC1231 Beginning Bowling (FA, SP)** Instruction and participation in bowling.

**PEAC1241 Beginning Volleyball (FA, SP)** Instruction and participation in volleyball.

**PEAC1251 Beginning Racquetball (FA, SP)** Instruction and participation in racquetball.

**PEAC1351 Beginning Golf (FA, SP)** Instruction and participation in golf.

**PEAC1371 Beginning Fencing (FA, SP)** Instruction and participation in fencing.

**PEAC1391 Fitness Walking (FA, SP)** Instruction and participation in vigorous walking for cardiovascular development and improvement.

**PEAC1401 Beginning Gymnastics for Men's Apparatus (FA, SP)** Instruction and participation in gymnastics with men's apparatus.

**PEAC1411 Beginning Gymnastics for Women's Apparatus (FA, SP)** Instruction and participation in gymnastics with women's apparatus.

**PEAC1431 Beginning Tennis (FA, SP)** Instruction and participation in tennis.

**PEAC1471 Beginning Badminton (FA, SP)** Instruction and participation in badminton.

**PEAC1481 Beginning Archery (FA, SP)** Instruction and participation in archery.

**PEAC1621 Fitness Concepts (FA, SP)** Acquaints students with a basic knowledge, understanding, and value of physical activity as related to optimal wellness.

**PEAC1631 Beginning Self Defense (FA, SP)** The fundamental techniques of dealing with assailants.

**PEAC1641 Beginning Judo (FA, SP)** The fundamental skills of judo.

**PEAC1651 Beginning Karate-Do (FA, SP)** The fundamental skills of karate-do as a martial art.

**PEAC1661 Weight Training (FA, SP)** Instruction and

participation in weight training.

**PEAC1801 Aerobic Dance I (FA, SP)** The fundamentals of aerobic dance as a physical fitness program.

**PEAC1811 Beginning Canoeing (FA, SP)** Instruction and participation in canoeing.

**PEAC1831 Beginning Scuba Diving (FA, SP)** Instruction and participation in scuba diving. Corequisite: PEAC 1830D.

**PEAC1830D Beginning Scuba Diving Drill (FA, SP, SU)** Corequisite: PEAC 1831.

**PEAC1901 Special Topics (FA, SP)** Instruction and participation in specialized activity. May be repeated for 4 hours.

**PEAC2131 Intermediate Swimming (FA, SP)** Refinement of basic strokes and techniques of swimming and progressive instruction in skills and techniques of diving. Prerequisite: PEAC 1131 or equivalent.

**PEAC2241 Intermediate Volleyball (FA, SP)** A continuation of the study and practice of volleyball fundamentals with emphasis on advanced skills and strategies. Prerequisite: PEAC 1241.

**PEAC2251 Intermediate Racquetball (FA, SP)** A continuation of the study and practice of racquetball fundamentals with emphasis on advanced skills, tournament play and strategy. Prerequisite: PEAC 1251.

**PEAC2351 Intermediate Golf (FA, SP, SU)** A continuation of the study and practice of golf fundamentals with emphasis on advanced skills. Prerequisite: PEAC 1351 or equivalent.

**PEAC2371 Intermediate Fencing (FA, SP)** A continuation of the study and practice of fencing fundamentals with emphasis on improvement of techniques already possessed by the student and mastery of advanced techniques. Prerequisite: PEAC 1371 or equivalent.

**PEAC2421 Intermediate Tumbling (SP)** The fundamentals of tumbling from basic rolls and balances to aerial movement and combinations. Prerequisite: PEAC 1401 and PEAC 1411.

**PEAC2431 Intermediate Tennis (FA, SP, SU)** A continuation of the study and practice of tennis fundamentals with emphasis on advanced skills, strategy, knowledge, and doubles play. Prerequisite: PEAC 1431 or equivalent.

**PEAC2511 Adaptive Activities (FA, SP)** Instruction and participation in sports, recreational and fitness type activities.

**PEAC2521 Adaptive Activities (FA, SP)** Instruction and participation in sports, recreational and fitness type activities.

**PEAC2631 Intermediate Self Defense (FA, SP)** A continuation of the study and practice of self defense with emphasis on advanced skills. Prerequisite: PEAC 1631.

**PEAC2641 Intermediate Judo (FA, SP)** A continuation of the study and practice of Judo fundamentals with emphasis on advanced skills. Prerequisite: PEAC 1641.

**PEAC2651 Intermediate Karate (FA, SP)** A continuation of the study and practice of taekwon-do with emphasis on advanced skills. Prerequisite: PEAC 1651.

**PEAC2801 Aerobic Dance II (FA, SP, SU)** A continuation of the study and practice of aerobic dance fundamentals with emphasis on improvement of physical fitness already possessed by the student. Prerequisite: PEAC 1801.

## (PHED) PHYSICAL EDUCATION

**PHED2003 Teaching Styles/Lesson Planning (FA, SP)** This course would present a variety of teaching techniques that can be utilized to convey the K-12 physical education curriculum. Discussion will also focus on proper planning procedures to assure efficient delivery of physical education lessons.

**PHED2013 Teaching Progressions and Assessment of Basic Skills (FA, SP)** This course serves as an introduction to motor skill analysis. Emphasis is placed on teaching and task analysis of locomotor, non-locomotor, and manipulative skills.

**PHED2023 Teaching Progressions and Assessment of Advanced Skills (FA, SP)** This course is designed to teach the progression and analysis of motor and sport skills. Specific emphasis is on the commonalities of various motor skills that apply to various sport movements. Prerequisite: PHED 2003 and PHED 2013.

**PHED2122 Coaching Baseball (SP)** Discussion and



participation of preseason and in-season training methods, skill development and administrative principles in the coaching of baseball. Prerequisite: sophomore standing.

**PHED2142 Coaching Track and Field (SP)**

Discussion and participation of preseason and in-season training methods, skill development and administrative principles in the coaching of track and field. Prerequisite: sophomore standing.

**PHED2252 Coaching of Football (SP)** Discussion and participation in preseason and off-season training methods.

**PHED2272 Coaching Basketball (FA)** Discussion and participation of preseason and in-season training methods, skill development and administrative principles in the coaching of basketball. Prerequisite: sophomore standing.

**PHED3001 Practicum I (FA)** All 5-year teaching option majors serve as teaching assistants in 1 physical education or dance education class under an experienced teacher. Prerequisite: junior standing.

**PHED3012 Teaching Games (FA)** This course is designed to provide opportunities for the student to acquire an understanding of developmentally appropriate games and why they should be part of a quality physical education program. Prerequisite: PHED 2003 and PHED 2013 and junior standing.

**PHED3022 Teaching Stunts and Tumbling (SP)** Instructional strategies for teaching public school students stunts and tumbling skills. Prerequisite: PHED 2003 and PHED 2013 and junior standing.

**PHED3032 Teaching Rhythms (SP)** Designed to teach K-12 Physical Education majors how to perform, teach, develop and implement rhythmic activity. Prerequisite: PHED 2003 and PHED 2013 and junior standing.

**PHED3042 Teaching Fitness (FA)** Instructional strategies for teaching public school students about fitness concepts. Prerequisite: PHED 2003 and PHED 2013 and junior standing.

**PHED3203 Principles and Problems of Coaching (FA, SP)** A focus on the various aspects of coaching the athletes in contemporary society through an examination of research findings related to factors affecting performance. Attention to be given to principles, problems and understanding essential to the management of athletic contests. Prerequisite: junior standing.

**PHED3373 Methods and Materials in Physical Education for Elementary School (FA, SP, SU)** Program planning and techniques of teaching physical education activities to children; for early childhood and elementary teachers, supervisors, and principals. Prerequisite: junior standing.

**PHED3903 Physical Education for Special Populations (FA, SP)** Provides fundamental concepts and skills essential to physical education programming for handicapped students. Deals with definitions, handicapping conditions, developmental and remedial activities, games, and sports. Prerequisite: junior standing.

**PHED4001 Practicum II (FA, SP, SU)** All 5-year teaching option majors serve as a coaching assistant at the K-12 level. Prerequisite: senior standing and PHED 3203.

**PHED4053 Teaching Individual/Dual Sports (FA, SP)** Instructional strategies for teaching individual and dual sport concepts to public school children. Corequisite: PHED 4063. Prerequisite: (PHED 2003 and PHED 2013 and PHED 2023) and junior standing.

**PHED4063 Teaching Team Sports (FA, SP)** Instructional strategies for teaching team sport concepts to public school children. Corequisite: PHED 4053. Prerequisite: (PHED 2003 and PHED 2013 and PHED 2023) and junior standing.

**PHED474V Student Teaching-Elementary (1-12) (FA, SP, SU)** Involves time at an off-campus school, where the student teacher has an opportunity under supervision to observe, to teach, and participate in other activities involving school and the community.

**PHED475V Student Teaching-Secondary (1-6) (FA, SP, SU)** Involves time at an off-campus school, where the student teacher has an opportunity under supervision to observe, to teach, and participate in other activities involving school and the community.

**PHED480V Workshop (1-6) (FA, SP, SU)**

**PHED5011L Measurement/Research/Statistics Laboratory (FA, SP, SU)** Cohort 5th year course. Application of content, principles, and concepts needed to become an effective evaluator/ researcher in kinesiology.

**PHED5023 Class Management (FA, SP, SU)** Cohort 5th year course that emphasizes class management; includes

professional ethics and school policies related to students, faculty and programs. A major part of course time will be field based.

**PHED5031L Curriculum Design Laboratory (FA, SP, SU)** This cohort 5th year course reviews curriculum models unique to physical education program; application of general principles of curriculum design and specific models as used in selected public school settings. Corequisite: CIED 5032.

**PHED507V Cohort Teaching Internship (1-6) (FA, SP, SU)** May be repeated for 6 hours.

**PHED5213 Philosophical Foundation (FA, SP, SU)** Presentation of philosophical approaches to the student of physical education and human movement phenomena. Special attention is given the development of qualitative approaches enabling students to examine problematic issues and practices in physical education, sport, and other movement forms.

**PHED5233 Research on Teaching in Physical Education (FA, SP, SU)** A review of contemporary research literature informing effective teaching practices in physical education settings. Students gain experience in critically reviewing literature in physical education as well as related behavioral science, education, and humanities disciplines; emphasis is placed in incorporating research finding into personal teaching strategies.

**PHED5253 The Physical Education Program (SU)** 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.

**PHED5263 Movement Education in the Elementary School Program (SP)** Movement concepts applied to the elementary school physical education program. Considers movement exploration techniques, locomotor, nonlocomotor, and manipulative skills.

**PHED5273 Critical Analysis of Professional Issues (SP)** 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. Corequisite: M.A.T cohort.

**PHED5383 Movement Experiences for Elementary School Children (FA, SP, SU)** This cohort 5th year course includes taxonomies of physical education, descriptive techniques of teaching effectiveness and of student behavior, evaluation of elementary level programs and students, and field trips to selected public schools.

**PHED5413 Adapted Physical Education (FA, SU)** Methods, techniques and special groups of physical education for the atypical child.

**PHED560V Workshop (1-3) (FA, SP, SU)**

**PHED5693 Practicum in Teaching (FA, SP, SU)** Scheduled practical field experience applying knowledge gained in PHED 5011 (Meas/Research/Stat Lab), PHED 5031 (Curr. Lab), and KINS 5643 (Motor Learning).

**PHED574V Internship (1-6) (SP)**

**PHED5793 Effective Teaching in Physical Education (FA)** This cohort fifth-year course focuses on the skills necessary to develop and maintain an effective physical education learning environment. Special attention is given to the development of effective units of instruction throughout the K-12 curriculum. Corequisite: M.A.T. cohort.

**PHED6353 Systematic observation Research in Physical Education (FA, SP, SU)** This course will help students understand systematic observation as a tool for studying teaching, coaching, learning; to develop skills in systematic observation techniques; and to collect data on behaviors in physical education and sport.

**PHED6363 Supervision in Physical Education (FA, SP, SU)** 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.

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## (PHIL) PHILOSOPHY

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**PHIL1203 Reflective Thinking (FA, SP)** Helping students acquire basic reasoning skills. Degree credit may not be earned for both 1203 and 2203.

**PHIL2003 Introduction to Philosophy (FA, SP, SU)** An examination of such basic philosophical topics as the existence of God, the nature of the human mind, the

relationship between appearance and reality, the forms and limits of human knowledge, freedom of the will, and standards of right and wrong. Includes both historical and contemporary readings.

**PHIL2003C Introduction to Philosophy (FA, SP)**

An examination of such basic philosophical topics as the existence of God, the nature of the human mind, the relationship between appearance and reality, the forms and limits of human knowledge, freedom of the will, and standards of right and wrong. Includes both historical and contemporary readings. Corequisite: PHIL 2000D.

**PHIL2003H Honors Introduction to Philosophy (FA, SP, SU)** An examination of such basic philosophical topics as the existence of God, the nature of the human mind, the relationship between appearance and reality, the forms and limits of human knowledge, freedom of the will, and standards of right and wrong. Includes both historical and contemporary readings.

**PHIL2000D Introduction to Philosophy Drill (FA, SP)** Corequisite: PHIL 2003C.

**PHIL2103 Introduction to Ethics (FA, SP, SU)**

Basic concepts of moral philosophy, including historical and contemporary literature concerned with such issues as ethical relativism vs. objectivism, duty, happiness, freedom of the will and responsibility, facts and values, individual liberty and society. Application of theories to substantive questions.

**PHIL2203 Logic (FA, SP, SU)** Traditional and modern methods of deductive and inductive inference. Degree credit may not be earned for both PHIL 1203 and 2203.

**PHIL3103 Ethics and the Professions (FA, SP, SU)**

After a survey of the standard theories of moral obligation, justice, and rights, the course focuses on specific moral problems that arise within engineering, business, and the professions.

**PHIL3203 Philosophy and the Christian Faith (IR)**

This course will deal with philosophical issues that arise in Christian theology. Topics to be discussed may include the doctrines of the Incarnation, the Trinity, Atonement, and Hell, as well as the nature of God and the relationship between faith and reason.

**PHIL390V Readings (1-6) (FA, SP, SU)**

**PHIL3923H Honors Colloquium (FA, SP, SU)** Treats a special topic of issue offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in philosophy).

**PHIL3933 Special Studies (IR)** A course (not independent study) that covers a topic or a philosopher not usually presented in depth in regular courses. May be repeated.

**PHIL3943 Philosophy and Physics (IR)** Examination of the metaphysical and epistemological implications of specific physical theories with an emphasis on twentieth-century physics. Topics covered may include the nature of space and time (particularly as described in relativity theory), the nature of the quantum mechanical world, and the temporal asymmetries found in thermodynamics and other areas of physics. Prerequisite: PHIL 2003.

**PHIL399VH Honors Course (1-6) (FA, SP, SU)** May be repeated for 12 hours. Prerequisite: junior standing.

**PHIL4003 Ancient Greek Philosophy (FA)** Pre-Socratics, Socrates, Plato, and Aristotle. Prerequisite: 3 hours of philosophy.

**PHIL4013 Platonism & Origin of Christian Theology (SP)** 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. Prerequisite: 3 hours of philosophy.

**PHIL4023 Medieval Philosophy (FA)** Includes Augustine, Bonaventure, Aquinas, Scotus, and Ockham.

**PHIL4033 Modern Philosophy-17th and 18th Centuries (SP)** British and Continental philosophy, including Bacon, Descartes, Spinoza, Leibniz, Hobbes, Locke, Berkeley, Hume, and Kant.

**PHIL4043 Nineteenth Century Continental Philosophy (FA)** 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.

**PHIL4063 Twentieth Century Continental Philosophy (SP)** 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.

**PHIL4073 History of Analytic Philosophy (SP)** 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. Prerequisite: 3 hours of philosophy.

**PHIL4083 Existentialism (SP)** Readings in major figures associated with "Existentialism" (e.g. Kierkegaard, Nietzsche, Heidegger, Sartre, Merleau-Ponty). Emphasis on connections between the metaphysical views of these thinkers, their views of freedom, their conceptions of modernity, and their responses to it.

**PHIL4093 Special Topics in Philosophy (IR)** This course will cover subject matter not covered in regularly offered courses. May be repeated twice for a maximum of 6 hours of credit, as content will vary.

**PHIL4113 Social and Political Philosophy (SP)** Selected philosophical theories of society, the state, social justice, and their connections with individuals.

**PHIL4123 Classical Ethical Theory (FA)** 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. Prerequisite: 3 hours of philosophy.

**PHIL4133 Contemporary Ethical Theory (FA)** 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. Prerequisite: 3 hours of philosophy.

**PHIL4143 Philosophy of Law (SP)** 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.).

**PHIL4203 Theory of Knowledge (FA)** An examination of skepticism, the nature and structures of knowledge and epistemic justification, human rationality, and the justification of religious belief. Prerequisite: 3 hours of philosophy.

**PHIL4213 Philosophy of Science (FA)** 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.

**PHIL4233 Philosophy of Language (SP)** 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, Dumett, and the advocates of possible worlds semantics.

**PHIL4253 Symbolic Logic I (FA)** 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. (Same as MATH 4253)

**PHIL4263 Symbolic Logic II (SP)** Topics include: soundness and completeness of propositional logic, soundness and completeness of quantification theory, the elements of model theory and recursion theory, Godel's incompleteness theorems, and the limitative theorems of Tarski and Church. Prerequisite: PHIL 4253 or MATH 4253.

**PHIL4303 Philosophy of Religion (SP)** Types of religious belief and critical examination of their possible validity, including traditional arguments and contemporary questions of meaning.

**PHIL4403 Philosophy of Art (SP)** Varieties of truth and value in the arts and aesthetic experience, focusing on the creative process in the art and in other human activities.

**PHIL4423 Philosophy of Mind (SP)** 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.

**PHIL4603 Metaphysics (IR)** 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. Prerequisite: 3 hours of philosophy.

**PHIL5763 Seminar: Aquinas (IR)**

**PHIL5823 Seminar: Spinoza (IR)**

**PHIL5843 Seminar: Hume (IR)**

**PHIL5883 Seminar: Wittgenstein (IR)**

**PHIL5893 Seminar: Heidegger (IR)**

**PHIL5903 Seminar: Social & Political Philosophy (IR)**

**PHIL5913 Seminar: Ethical Theory (IR)**

**PHIL5933 Seminar: Philosophical Theology (IR)**

**PHIL5953 Seminar: Philosophy of Language (IR)**

**PHIL5963 Seminar: Philosophy of Mind (IR)**

**PHIL5973 Seminar: Metaphysics (IR)**

**PHIL5983 Philosophical Seminar (IR)** Various topics and issues in historical and contemporary philosophy.

**PHIL600V Master's Thesis (1-6) (FA, SP, SU)**

**PHIL690V Graduate Readings (1-6) (FA, SP, SU)** Supervised individual readings in historical and contemporary philosophy.

**PHIL700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (PHSC) PHYSICAL SCIENCE

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**PHSC0003 Survey of Chemistry and Physics (SP)**

An introduction to fundamental concepts of chemistry and physics. Designed for freshman assigned a course deficiency in natural sciences. Credit earned in this course may not be applied to the total required for a degree.

**PHSC5003 Higher Order Thinking in Science (FA, SP, SU)** Laboratory approach to teaching science as integrated, constructive processes involving experimentation, investigation, communication, reasoning, and problem solving. Subject foundation show connections and applications in life, earth, and physical systems. Training to improve content learning, learning environments, and the use of manipulatives, calculators, and science equipment.

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## (PHYS) PHYSICS

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**PHYS100V Projects (1-2) (FA, SP, SU)** Independent study in experimental or theoretical physics for lower division undergraduate students. May be repeated for 2 hours.

**PHYS1023 Physics and Human Affairs (FA, SP, SU)** The great ideas of physics, together with their philosophical and social impact. Scientific topics include cosmology, relativity, quantum mechanics. Philosophical and social topics include methods and values of science, problems related to energy sources, and implications of modern weapons. Non-mathematical. Designed for non-science majors. Along with PHYS 1021L, can be used to satisfy a 4-year physical science requirement for a B.A. degree. Students who have received credit in PHYS 2013 and 2033, or 2053 and 2073 cannot also receive degree credit in this course.

**PHYS1021L Physics and Human Affairs Laboratory (FA, SP, SU)** Laboratory 2 hours per week. Pre- or Corequisite: PHYS 1023.

**PHYS1044 Physics for Architects I (FA)** The relation between the principles of physics and the practice of building and operating structures. Topics include: The behavior of structures under various loads, the statics and dynamics of fluids, thermal storage, thermal expansion, the greenhouse effect, heat transfer, refrigeration, the energy problem, efficiency in the operation of buildings. One underlying theme is that the self-sufficiency of a building is an important part of architecture. Lecture 3 hours, laboratory 2 hours per week. Corequisite: PHYS 1040L.

**PHYS1040L Physics for Architects I Laboratory (FA)** Corequisite: PHYS 1044.

**PHYS1054 Physics for Architects II (SP)** Acoustics, electricity and magnetism, light, and environmental physics. Topics include resonance, acoustical isolation, interference, reverberation time, electrical circuitry with emphasis on power and efficiency, electrical storage, light sources, reflection, refraction, absorption, transmission, color, astronomy (to give perspective to the use of sunlight in architecture), heat, noise, and radioactivity pollution. Lecture 3 hours, laboratory 2 hours per week. Corequisite: PHYS 1050L. Prerequisite: PHYS 1044.

**PHYS1050L Physics for Architect II Laboratory (SP)** Corequisite: PHYS 1054.

**PHYS2013 College Physics I (FA, SU)** A non-calculus survey of the principles of physics including mechanics, heat and sound. Lecture 3 hours per week and drill (PHYS 2010D) 1 hour per week. Corequisite: PHYS 2010D and PHYS 2011L. Prerequisite: (MATH 1203 and MATH 1213) or equivalent.

**PHYS2011L College Physics I Laboratory (FA, SU)** Laboratory 2 hours per week. Corequisite: PHYS 2010D and PHYS 2013.

**PHYS2010D College Physics I Drill (FA, SU)** Corequisite: PHYS 2011L and PHYS 2013.

**PHYS2033 College Physics II (SP, SU)** Continuation of PHYS 2013. Topics include electricity and magnetism, light, relativity, quantum mechanics, atomic and nuclear structure. Lecture 3 hours, drill (PHYS 2030D) 1 hour per week. Corequisite: PHYS 2030D and PHYS 2031L. Prerequisite: PHYS 2013.

**PHYS2031L College Physics II Laboratory (FA, SP)** Laboratory 2 hours per week. Corequisite: PHYS 2030D and PHYS 2033.

**PHYS2030D College Physics II Drill (SP, SU)** Corequisite: PHYS 2031L and PHYS 2033.

**PHYS2054 University Physics I (FA, SP, SU)** Introduction to the principles of mechanics, wave motion, temperature and heat, with calculus. Lecture three hours per week and practicum two hours a week (included in PHYS 2050L). Pre- or Corequisite: MATH 2554. Corequisite: PHYS 2050L.

**PHYS2054H Honors University Physics I (FA, SP, SU)** Introduction to the principles of mechanics, wave motion, temperature and heat, with calculus. Lecture three hours per week and practicum two hours a week (included in PHYS 2050L). Pre- or Corequisite: MATH 2554. Corequisite: PHYS 2050L.

**PHYS2050L University Physics I Lab (FA, SP, SU)** The laboratory includes a practicum component integrating it with the lecture (PHYS 2054 and meets twice a week for two hours at each meeting). Corequisite: PHYS 2054.

**PHYS2050M Honors University Physics I Lab (FA)** Laboratory includes a practicum component integrating it with the lecture (PHYS 2054H and meets twice a week for two hours at each meeting). Corequisite: PHYS 2054H.

**PHYS2074 University Physics II (FA, SP, SU)**

Continuation of PHYS 2054. Topics covered include electricity, magnetism, light and geometric optics. Lecture three hours per week and practicum two hours per week. Pre- or Corequisite: MATH 2564. Corequisite: PHYS 2070L. Prerequisite: PHYS 2054.

**PHYS2074H Honors University Physics II (SP)** Continuation of PHYS 2054H. Topics covered include electricity, magnetism, light and geometric optics. Lecture three hours per week and practicum two hours per week (included in PHYS 2070M). Pre- or Corequisite: MATH 2564. Corequisite: PHYS 2070M. Prerequisite: PHYS 2054 or PHYS 2054H.

**PHYS2070L University Physics II Laboratory (FA, SP, SU)** The laboratory includes a practicum component integrating it with the lecture (PHYS 2074) and meets twice a week for two hours at each meeting. Corequisite: PHYS 2074.

**PHYS2070M Honors University Physics II**

**Laboratory (SP)** The laboratory including practicum meets twice a week for two hours at each meeting. Corequisite: PHYS 2074H.

**PHYS2094 University Physics III (FA)** A continuation of PHYS 2054 and PHYS 2074. Topics include waves, physical optics, thermodynamics, kinetic theory, and an introduction to quantum mechanics. Lecture 3 hours per week and practicum 2 hours per week (included in PHYS 2090L). Pre- or Corequisite: MATH 2574. Corequisite: PHYS 2090L. Prerequisite: PHYS 2074.

**PHYS2090L University Physics III Laboratory/**

**Practicum (FA)** The laboratory includes a practicum component integrating it with the lecture (PHYS 2093) meets twice a week for two hours at each meeting. Corequisite: PHYS 2094.

**PHYS220V Introduction to Electronics I (1-2) (FA, SP, SU)** Individualized, self-paced laboratory instruction in electronics requiring no previous electronics experience. Topics include basic DC and AC electronics fundamentals. May be repeated for 2 hours. Pre- or Corequisite: MATH 1203 or MATH 1285.

**PHYS306V Projects (1-3) (IR)** Individual experimental or theoretical research problems for advanced undergraduates.

**PHYS3113 Analytical Mechanics (SP)** Newton's laws of motion applied to particles, systems of particles, and rigid

bodies. Introduction to Lagrange's equations and expansions. Prerequisite: PHYS 2074.

**PHYS320V Introduction to Electronics II (1-4)** (FA, SP, SU) Individualized, self-paced laboratory instruction in electronics, covers topics including semiconductor devices, electronic circuits, and digital techniques. May be repeated for 4 hours. Prerequisite: PHYS 220.

**PHYS3414 Electromagnetic Theory** (FA) Electrostatics including dielectrics, magnetostatics and magnetic materials. Maxwell's equations, radiation theory, and wave propagation. Prerequisite: PHYS 2074 and MATH 2574.

**PHYS3544 Optics** (FA) Elements of geometrical, physical, and quantum optics. Lecture 3 hours, laboratory 2 hours. Corequisite: PHYS 3540L. Prerequisite: PHYS 2074 or MATH 2564.

**PHYS3540L Optics Laboratory** (FA) Corequisite: PHYS 3544.

**PHYS3603 Introduction to Modern Physics** (FA, SP, SU) An introduction to the basic ideas of 20th century physics, with an emphasis on those that form the foundations of modern technology: quantum theory and its application to atomic, nuclear, optical and condensed matter physics. No credit is given toward a B.S. degree in physics. Prerequisite: PHYS 2033 and (MATH 2043 or MATH 2554).

**PHYS3601L Modern Physics Laboratory** (FA, SP, SU) Experiments illustrating the development and concepts of modern physics. No credit given toward a B.S. major in physics. Prerequisite: PHYS 3603.

**PHYS3614 Modern Physics** (FA, SP, SU) Introduction to special relativity, statistical physics, quantum physics, and a survey of nuclear and particle physics. Review of thermal radiation, photon, and wave mechanics. Prerequisite: PHYS 2074.

**PHYS3923H Honors Colloquium** (IR) Covers a special topic or issue, offered as part of the honors program. No more than 3 hours may be offered toward fulfillment of the requirements for the B.S. or B.A. degree in Physics. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in physics).

**PHYS399VH Honors (1-6)** (FA, SP, SU) Independent study for physics students enrolled in the honors program. May be repeated for 6 hours. Prerequisite: junior standing.

**PHYS400V Laboratory and Classroom Practices in Physics (1-3)** (FA, SP, SU) The pedagogy of curricular materials. Laboratory and demonstration techniques illustrating fundamental concepts acquired through participation in the classroom as an apprentice teacher. Prerequisite: PHYS 3114 and PHYS 3414.

**PHYS4073 Introduction to Quantum Mechanics** (FA) A survey of quantum mechanics from the wave mechanical point of view. Required course for B.S. Physics majors. Prerequisite: PHYS 3614 and MATH 3404.

**PHYS4103 Physics in Perspective** (SP, Odd years) Human implications of physics, including life's place in the universe, the methods of science, human sense perceptions, energy utilization, social impacts of technology, and the effect of physics on modern world views. No credit given toward a B.S. major in physics. Prerequisite: PHYS 3603 or PHYS 3614.

**PHYS4113 Physics in Perspective** (SP, Odd years) Human implications of physics, including life's place in the universe, the methods of science, human sense perceptions, energy utilization, social impacts of technology, and the effect of physics on modern world views. Credit allowed for only one of PHYS 4113 or PHYS 4103. Prerequisite: PHYS 3614.

**PHYS4203 Physics of Devices** (SP, Even years) Principles of physics applied in a selection of technologically important devices in areas including computing, communications, medical imaging, lasers, and energy utilization. Students will utilize technical journals. No credit given toward a B.S. major in physics. Prerequisite: PHYS 3603 or PHYS 3614.

**PHYS4213 Physics of Devices** (SP, Even years) Principles of physics applied in a selection of technologically important devices in areas including computing, communications, medical imaging, lasers, and energy utilization. Students will utilize technical journals. Credit allowed for only one of PHYS 4203 or PHYS 4213. Prerequisite: PHYS 3614.

**PHYS4333 Thermal Physics** (SP, Even years) Equilibrium thermodynamics, statistical physics, and kinetic energy. Prerequisite: PHYS 3614.

**PHYS4621L Modern Physics Laboratory** (FA) (Formerly PHYS 462L) Advanced experiments, projects, and techniques in atomic, nuclear, and solid state physics.

**PHYS4653 Subatomic Physics** (IR) Nuclear structure

and nuclear reactions. Nature and properties of elementary particles and resonances, their interactions and decays. Phenomenological theory and discussion of experimental evidence. Prerequisite: PHYS 3614.

**PHYS4713 Solid State Physics** (SP) Crystal structure, diffraction and symmetry. Lattice vibrations, elasticity and optical properties. Electronic structure, band theory, transport and magnetism. Course emphasizes applications and current topics in semiconductors, optics and magnetism. Pre- or Corequisite: PHYS 3414 and PHYS 4333.

**PHYS4734 Introduction to Laser Physics** (SP) 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. Prerequisite: PHYS 3414 and PHYS 3544.

**PHYS4754 Introduction to Applied Nonlinear Optics** (FA) A combined lecture/laboratory course. 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 that are finding current practical applications in industry. Pre- or Corequisite: PHYS 3414 and PHYS 3544.

**PHYS4774 Introduction to Optical Properties of Materials** (SP) A combined lecture/laboratory course covering crystal symmetry optical transmission and absorption, light scattering (Raman and Brillouin) optical constants, carrier mobility, and polarization effects in semiconductors, quantum wells, insulators, and other optically important materials. Prerequisite: PHYS 3414 and PHYS 3544.

**PHYS4794 Lightwave Communication** (SP, Odd years) A laboratory based course on light propagation in planar and fiber waveguides, optical coupling, operation principles of semiconductor lasers, detectors, and LEDs, hands-on experience with applications in communication systems. Prerequisite: PHYS 3414 or ELEG 3703.

**PHYS4803 Mathematical Physics** (IR) Development of mathematics used in advanced physics, including tensors, matrices, group theory, special functions and operators. Prerequisite: MATH 2574.

**PHYS498V Senior Thesis** (1-6) (FA, SP, SU)

**PHYS4991 Physics Senior Seminar** (FA, SP, SU) Student mastery of the principles of physics are assessed by means of research paper writing and an examination chosen by the faculty. The research paper may be used to satisfy the Fulbright College writing requirement. (Required of all B.S. and B.A. physics majors in their last year.)

**PHYS501V Seminar** (1-3) (FA, SP, SU) Regular informal discussions of research reported in journals and monographs.

**PHYS502V Individual Study in Advanced Physics** (1-3) (FA, SP) Guided study in current literature.

**PHYS5073 Mathematical Methods of Physics I** (FA) Applications of complex variables, differential equations, special functions, Green's functions, and matrix analysis to problems in physics. Introduction to numerical and statistical techniques used in physics research. Prerequisite: MATH 3423.

**PHYS5083 Mathematical Methods of Physics II** (SP) 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 or MATH 5073.

**PHYS5103 Advanced Mechanics** (SP) Dynamics of particles and rigid bodies. Hamilton's equations and canonical variables. Canonical transformations. Small oscillations. Prerequisite: PHYS 5033 and PHYS 5073.

**PHYS5123 Research Techniques I: Condensed Matter Physics** (SP) Experimental and theoretical approaches to research in condensed matter, with introduction to laboratory equipment and techniques used in MS level research in these areas. Literature survey of current research topics. This course focuses on basic research techniques available in the department (on campus). Prerequisite: graduate standing

**PHYS5133 Research Techniques I: Atomic, Molecular, and Optical Physics** (SP) Experimental and theoretical approaches to research in atomic, molecular, and optical physics, with introduction to laboratory equipment and techniques used in MS level research in these areas. Literature surveys of current research topics. This course focuses on basic research techniques available in the department (on campus). Prerequisite: graduate standing.

**PHYS5213 Statistical Mechanics** (FA) Classical and quantum mechanical statistical theories of matter and

radiation. Prerequisite: PHYS 4333 and PHYS 5064.

**PHYS5333 Advanced Electromagnetic Theory** (SP) Electrostatic boundary-value problems, Maxwell's equations, plane waves, waveguides, cavities, radiating systems, special relativity and relativistic electrodynamics. Prerequisite: PHYS 5073.

**PHYS5413 Quantum Mechanics I** (FA) 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, semiclassical theory of radiation. Prerequisite: PHYS 5064.

**PHYS5423 Quantum Mechanics II** (SP) 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, semiclassical theory of radiation. Prerequisite: PHYS 5064 and PHYS 5413.

**PHYS5513 Atomic and Molecular Physics** (SP, Even years) Survey of atomic and molecular physics with emphasis on the electronic structure and spectroscopy on 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 5054.

**PHYS5523 Theory of Relativity** (IR) 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. Prerequisite: PHYS 5103 and PHYS 5323.

**PHYS5713 Solid State Physics** (SP, Odd years) Crystalline structure, lattice dynamics. Debye theory, electron theory of metals, band theory of solids, superconductivity, and magnetism. Prerequisite: PHYS 5054.

**PHYS5734 Laser Physics** (SP) 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. Prerequisite: PHYS 3414 and PHYS 3544.

**PHYS574V Internship in College or University Teaching** (3-9) (FA, SP, SU) Supervised field experiences in student personnel services, college administration, college physics teaching, institutional research, development, or other areas of college and university work. May be repeated for 3 hours. Pre- or Corequisite: PHYS 400.

**PHYS5754 Applied Nonlinear Optics** (FA) A combined lecture/laboratory course. 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 that are finding current practical applications in industry. Prerequisite: PHYS 3414 and PHYS 3544.

**PHYS5774 Introduction to Optical Properties of Materials** (FA) A combined lecture/laboratory course covering crystal symmetry optical transmission and absorption, light scattering (Raman and Brillouin) optical constants, carrier mobility, and polarization effects in semiconductors, quantum wells, insulators, and other optically important materials. Prerequisite: PHYS 3414 and PHYS 3544.

**PHYS5794 Lightwave Communication** (FA, SP, SU) A laboratory-based course in light propagation in planar and fiber waveguides, optical coupling, operation principles of semiconductor lasers, detectors, and LEDs, hands-on experience with applications in communication systems. Prerequisite: PHYS 3414 or ELEG 3703.

**PHYS5811 Research and Operations Management Seminar** (FA, SP, SU) Weekly seminar of physics candidates for the Master of Science degree to discuss issues that impact a technical group's research and operational effectiveness. Topics include ethics, applications of procedures, cultural impact on operations, and team-based methodologies as well as current events in the interaction between technology and human affairs. May be repeated for 6 hours. Prerequisite: physics graduate standing.

**PHYS5823 Advanced Device Design** (FA) Study of the state-of-the-art physics of materials applied to advanced technology devices. Students will define new devices based on current physics research on campus, and will predict both technological and market success of the devices using technology market space analysis techniques. Prerequisite: graduate standing physics.



**PHYS5833 Advanced Device Prototypes (SP)**

Continuation of PHYS 5823, with reduction to practice of devices defined in PHYS 5823. Student teams will develop deeper understanding of the physics of materials identified, predict the characteristics of devices made from those materials, and fabricate and characterize prototype devices. Prerequisite: PHYS 5823.

**PHYS588V Selected Topics in Experimental Physics (1-3) (IR)**

**PHYS590V Master of Arts Research (1-6) (FA, SP, SU)**

**PHYS600V Master of Science Thesis (1-6) (FA, SP, SU)**

**PHYS6123 Research Techniques II: Condensed Matter Physics (FA)** Experimental and theoretical approaches to research in condensed matter, with introduction to laboratory equipment and techniques used in PhD level research in these areas. This course concentrates on advanced research techniques, including examination of specific research methods and apparatus at research partner academic and industrial sites. Prerequisite: PHYS 5123.

**PHYS6133 Research Techniques II: Atomic, Molecular, and Optical Physics (FA)** Experimental and theoretical approaches to research in atomic, molecular, and optical physics, with introduction to laboratory equipment and techniques used for PhD level research in these areas. This course concentrates on advanced research techniques, including examination of specific research methods and apparatus at research partner academic and industrial sites. Prerequisite: PHYS 5133.

**PHYS6413 Quantum Mechanics III (FA, Even years)** Relativistic quantum mechanics, second quantization, with applications to quantizing electromagnetic fields and to many-body theory. Introduction to Feynman diagrams. Prerequisite: PHYS 5423.

**PHYS6613 Quantum Optics (FA, Odd years)** 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.

**PHYS6713 Advanced Solid State Theory (IR)** Quantum mechanical approach to the theory of solids, including such topics as group theory, crystalline field theory, electron-photon interactions, band theory of solids, transport phenomena, superconductivity, and magnetic properties of solids. Prerequisite: PHYS 5713 and PHYS 5413.

**PHYS6811 Research and Operations Management Seminar (FA, SP, SU)** Weekly seminar of physics candidates for the Doctor of Philosophy degree to discuss issues that impact a technical group's research and operational effectiveness. Topics include ethics, applications of procedures, cultural impact on operations, and team-based methodologies, as well as current events in the interaction between technology and human affairs. May be repeated for 12 hours. Prerequisite: physics graduate standing and PHYS 5811.

**PHYS700V Doctoral Dissertation (1-18) (FA, SP, SU)**

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## (PLPA) PLANT PATHOLOGY

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**PLPA2013 Pest Management (FA, SP)** Introduction to basic principles of pest management as they relate to vertebrate animals, insects, plant disease and weeds. Selected pests are studied with emphasis on current management approaches and alternative pest control. Prerequisite: (ANSC 1003 or POSC 1003) and (CSES 1203 or HORT 1203).

**PLPA3004 Principles of Plant Pathology (FA)** Examination of the causes and symptoms of plant disease and the genetics of plant disease. Physiology, and ecology of host-pathogen interactions. Spread of disease and principles of disease control. Corequisite: PLPA 3000L.

**PLPA3000L Principles of Plant Pathology Laboratory (FA)** Corequisite: PLPA 3004.

**PLPA400V Research (1-6) (FA, SP, SU)** Original investigations of assigned problems in plant pathology. Prerequisite: PLPA 3004.

**PLPA4093 Issues in Pest Management (SP)** Lecture and discussion on local, regional, national and international issues related to pest management policy, ethics,

environment, society and science (not for graduate credit). (Same as CSES 4093, ENTO 4093) Prerequisite: must have completed 60 hours of coursework.

**PLPA4103 Plant Disease Control (FA)** 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. Prerequisite: PLPA 3004.

**PLPA4333 Biotechnology in Agriculture (FA)** 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.

**PLPA462V Internship (3-6) (IR)** Supervised practical work experience in pest management to develop and demonstrate professional competence. A maximum of 6 hours credit per semester or summer session is permitted. Faculty approval of projects proposal prior to enrollment, and written or oral reports are required. May be repeated for 9 hours.

**PLPA5001 Seminar (FA, SP)** Review of scientific literature and oral reports on current research in plant pathology. May be repeated for 4 hours. Prerequisite: graduate standing.

**PLPA502V Special Problems Research (1-6) (FA, SP, SU)** Original investigations of assigned problems in plant pathology. Prerequisite: graduate standing.

**PLPA504V Special Topics (1-4) (IR)** Lecture topics of current interest not covered in other courses in plant pathology or other related areas. Prerequisite: graduate standing.

**PLPA5303 Advanced Plant Pathology: Genetics and Physiology (SP, Odd years)** Presentation of important contemporary concepts relative to the genetics, physiology, biochemistry, and molecular biology of plant pathogens and plant disease. Lecture 3 hours per week. Prerequisite: PLPA 3004 and graduate standing.

**PLPA5313 Advanced Plant Pathology: Ecology and Epidemiology (SP, Even years)** 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 3004 and graduate standing.

**PLPA5404 Diseases of Economic Crops (SU)** 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: PLPA 5400L. Prerequisite: PLPA 3004.

**PLPA5400L Diseases of Economic Crops Laboratory (SU)** Corequisite: PLPA 5404.

**PLPA5532 Professionalism in Plant Science (SP, Odd years)** Discussion of professionalism in science, science ethics and other topics associated with science as a profession such as research funding, writing for publication, career choices, and career development. Prerequisite: graduate standing.

**PLPA5603 Plant Pathogenic Fungi (FA, Odd years)** 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: PLPA 5600L. Prerequisite: PLPA 3004 or BOTY 4424 or graduate standing.

**PLPA5600L Plant Pathogenic Fungi Lab (FA, Odd years)** Corequisite: PLPA 5603.

**PLPA5713 Introduction of Electron Microscopy (SP)** Use of the electron microscope in biological research, including the preparation of various plant and animal specimens and their observation with the electron microscope. Lecture 1 hour, laboratory 4 hours per week. Prerequisite: graduate standing.

**PLPA600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**PLPA6203 Plant Virology (FA, Odd years)** 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: PLPA 6200L. Prerequisite: graduate standing.

**PLPA6200L Plant Virology Lab (FA, Odd years)** Corequisite: PLPA 6203.

**PLPA6303 Plant Nematology (FA, Even years)** Nematodes and their relationship to plant diseases, with consideration of identification, morphology, biology, distribution, association with disease complexes and control. Lecture 2 hours, laboratory 2 hours per week. Corequisite: PLPA 6300L. Prerequisite: graduate standing.

**PLPA6300L Plant Nematology Laboratory (FA, Even years)** Corequisite: PLPA 6303.

**PLPA6503 Plant Bacteriology (SP, Odd years)** 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 week. Corequisite: PLPA 6500L. Prerequisite: MBIO 2013 and MBIO 2011L.

**PLPA6500L Bacterial and Mycoplasma Plant Pathogens Laboratory (SP, Odd years)** Corequisite: PLPA 6503.

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## (PLSC) POLITICAL SCIENCE

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**PLSC2003 American National Government (FA, SP, SU)** Survey of the history, basic ideas, structure, and political processes of the national government of the United States, including the fundamental relationships of the federal system. Required of all political science majors.

**PLSC2003H Honors American National Government (FA)** Survey of the history, basic ideas, structure, and political processes of the national government of the United States, including the fundamental relationships of the federal system.

**PLSC2013 Introduction to Comparative Politics (FA, SP, SU)** An introductory survey of comparative political systems.

**PLSC2203 State and Local Government (FA, SP)** Organization and functions of state and local governments in the United States, intergovernmental relations, administration, adjudication, and the organization and function of political parties on state and local levels.

**PLSC2813 Introduction to International Relations (SP, SU)** Introduction to the international system, theories of international behavior, political economy, conflict and peacemaking, the third world, international law and organizations, and the nature of the post-cold war world.

**PLSC300V Internship in Public Affairs (1-3) (FA, SP, SU)** Work experience in a public agency arranged by the student under the guidance of a faculty member. Paper required. May be repeated for 6 hours.

**PLSC3103 Public Administration (FA, SP)** Trends and organization of public administration, dynamics of management; fiscal and personnel management; administrative powers and responsibility. Prerequisite: PLSC 2003.

**PLSC3113 Dynamics of Service Sector Organizations (SP)** Study of service sector organizations (public and nonprofit organizations). Emphasis is placed on management challenges, conflict resolution, leadership and accountability of these organizations. The course addresses recent changes in the environment of service organizations such as the emergence of public private partnerships.

**PLSC3153 Public Policy (SP)** A study of public policy formulation, implementation, and evaluation at various levels of government. Prerequisite: PLSC 2003.

**PLSC3183 Public Personnel Management (FA, SP, SU)** Development of the merit system in government, career systems, human resource planning and development, labor relations, diversity issues, and the legal dimension of public personnel systems. Prerequisite: PLSC 2003.

**PLSC3203 Political Opinion (FA)** Survey of the process by which people formulate their opinions on public matters and transmit them to governmental decision makers.

**PLSC3223 Arkansas Politics (FA)** The political system in Arkansas including the political process, public policy, social problems, political behavior, governmental structure, and contemporary issues. Prerequisite: PLSC 2003.

**PLSC3243 The Judicial Process (FA)** The structure and operation of the state and national court systems. Emphasis is upon the role of the judiciary in the American political system and the political aspects and consequences of judicial decision-making. Prerequisite: PLSC 2003.

**PLSC3253 Urban Politics (FA)** Analysis of comparative urban systems, including political process, public policy, social problems, governmental structure, and voter behavior. Prerequisite: PLSC 2003.

**PLSC3503 Governments and Politics of East Asia**



(IR) Comparative analysis of structures, processes, and problems of the political systems of the Democratic Republic of Vietnam, Japan, and the Peoples Republic of China. Prerequisite: PLSC 2013.

**PLSC3523 Politics of the Middle East (FA, SP, SU)** Survey of the unity and diversity in the political development of the Middle East, as evident in historical legacies, state formation, civil society, social class, and political identity.

**PLSC3533 Political Development (FA)** Introduction to change in the developing world (Africa, Asia, Latin America, Middle East). Comprising 2/3 of states, they share a legacy of foreign intervention and economic need. We examine diverse approaches: modernization, dependency, class, political economy. Issues may include debt, gender, ideological empowerment, human rights, gaps between theory and practice. Prerequisite: PLSC 2013.

**PLSC3553 Western European Politics (FA)** Comparative analysis of Western European parliamentary systems with special attention to political traditions, constitutional arrangements, socio-economic structure, and the political and legislative processes in countries such as Britain, France, and Germany. Prerequisite: PLSC 2003 or PLSC 2013.

**PLSC3573 Governments and Politics of Latin America (FA)** Comparative survey of Latin America political forces and institutions with special attention to patterns and problems of political change and development in that area. Prerequisite: PLSC 2003.

**PLSC3603 Scope and Methods of Political Science (IR)** The basic principles and assumptions of political inquiry (methodology) and research techniques for gathering and analyzing data about political phenomena. Prerequisite: PLSC 2003.

**PLSC3803 International Organization (FA)** The theory and practice of international organizations past and present, with emphasis on the United States and a critical examination of current trends. Prerequisite: junior standing.

**PLSC3813 International Law (SP)** Analysis of the traditional principles of public international law including the law of war, the law of sea and air, and the legal nature of statehood; and analysis of selected principles of private international law relevant to such topics as the multinational corporation, international arbitration, commerce with Communist states, and the expropriation of foreign property. Prerequisite: junior standing.

**PLSC3823 Theories of International Relations (FA, SP)** Analysis of major intellectual traditions in the field of international relations, including realism, liberalism, and social constructivism. Emphasis will be placed on how they help us to understand war, revolution, global capitalism, nationalism, peace, and other significant international phenomena. Prerequisite: PLSC 2003 and PLSC 2013.

**PLSC3853 American Foreign Policy (FA, SP)** The structure and process for making and implementing the foreign policy of the United States, and an evaluation of current policies in the contemporary international milieu. Prerequisite: PLSC 2003 or PLSC 2013.

**PLSC3913 American Political Thought Before 1900 (FA)** Major ideas, issues, and arguments in American Political Thought from the colonial period to approximately 1900. May be repeated.

**PLSC3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy in political science.

**PLSC3933 Contemporary American Political Thought (SP)** Twentieth century American political thought, including who should participate, expanding concepts of freedom, political economy, equality, feminism, rights, conservatism and liberalism.

**PLSC394V Readings in Political Science (1-3) (FA, SP, SU)** For advanced students who wish to study some field of political science beyond the course offering available in that field. May be repeated for 6 hours. Prerequisite: junior standing.

**PLSC3953 Ancient and Medieval Political Thought (FA)** leading political works by classical writers during ancient and medieval European history.

**PLSC3963 Modern European Political Thought (SP)** Major European political writings from Machiavelli to the present. Prerequisite: junior standing.

**PLSC3973 Twentieth Century Political Thought (FA)** Twentieth century political thought including authority, obligation, dissent, government and economy, politics and technology, alienation, anarchy, pacifism, positivism and existentialism within the general context of democratic-Marxist controversies.

**PLSC3983 Politics in Literature (SP)** Analysis of political theories and issues through extensive reading and discussion of selected works of literature. Prerequisite: PLSC 2003 or PLSC 2013.

**PLSC399VH Honors Course (1-3) (FA, SP, SU)** May be repeated for 6 hours. Prerequisite: junior standing.

**PLSC400V Special Topics (1-3) (IR)** Topics in political science not usually covered in other courses. May be repeated.

**PLSC4053 Political Sociology (FA)** Analysis of political institutions and movements in relation to power, social class, ideology, and related variables.

**PLSC4193 Administrative Law (SP)** Legal aspects of the administrative process and the effect of legal principles and processes upon administrative decision-making. Emphasis is given to the limitation of administrative discretion and the judicial review of administrative decision. Prerequisite: PLSC 3103 or PLSC 4253.

**PLSC4203 American Political Parties (FA, SP)** The nature, function, and history of political parties in then United States with emphasis on party membership, organization, campaign techniques, finance and electoral alliances. Prerequisite: PLSC 2003.

**PLSC4213 Campaigns and Elections (IR)** This course examines the American electoral process. It is an empirical course that provides opportunities for original analysis of survey data and election returns. Emphasis is placed on the most recent federal election.

**PLSC4223 The American Congress (FA)** Thorough examination of the constitutional role of the legislative branch under the Constitution; the internal procedures and personalities of the Senate and House; the central place of Congress in shaping domestic and foreign policy. Prerequisite: PLSC 2003.

**PLSC4243 Minority Politics (SP)** Reviews political action and concepts of political activity by minority groups, focusing on contemporary political behavior.

**PLSC4253 The Supreme Court and the Constitution (FA)** United States Supreme Court decisions involving the functions and powers of Congress, the Supreme Court, and the President and federalism. Prerequisite: PLSC 2003.

**PLSC4263 The Supreme Court and Civil Rights (SP)** United States Supreme Court decisions interpreting the political, economic, and civil rights of individuals and groups. Prerequisite: PLSC 2003.

**PLSC4273 Political Psychology (SP)** Examines role of the individual in the polity including basic psychological constructs of relevance to political action, the formulation and maintenance of stable political orientations, the patterns linking the individual to the polity, and major modes of inquiry. Prerequisite: PLSC 2003.

**PLSC4283 Federalism and Intergovernmental Relations (FA, SP, SU)** 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.

**PLSC4373 Political Communication (SP)** Study of the nature and function of the communication process as it operates in the political environment. (Same as COMM 4373)

**PLSC4503 African Politics (SP)** Comparative analysis of structures, processes and problems of selected Sub-Saharan African political systems.

**PLSC4513 Creating Democracies (FA, Even years)** Analyses of the creation of democracies in Europe, South America, Asia, Africa, the Middle East, East Europe, and the former Soviet Union. Prerequisite: PLSC 2013.

**PLSC4543 Government and Politics of Eastern Europe (SP)** Study of the politics of East European nations primarily after World War II, with emphasis on the role of the period of communist rule and democratization. Prerequisite: PLSC 2003 or PLSC 2013.

**PLSC4563 Government and Politics of Russia (SP)** Study of Russian and Soviet politics after 1917 and of the democratization of Russia and the other successor states. Prerequisite: PLSC 2003 or PLSC 2013.

**PLSC4573 Gender and Politics (SP, Even years)** Examines the significance of gender in politics. Includes discussion of the women's movement and feminist theory, but emphasizes the content and process of public policy as it relates to women and men. Focus is on the U.S. but final third is devoted to comparative topics. Prerequisite: PLSC 2003 or PLSC 2013.

**PLSC4583 Political Economy of the Middle East (FA, SP, SU)** Examines the links between politics and economics in the Middle East and the impact of that nexus on

development. Analyses of global and regional integration, oil states, statist development, liberalization and privatization, and resources and population movements to understand power and class in the area.

**PLSC4593 Islam and Politics (FA, SP, SU)** 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.

**PLSC4803 Foreign Policy Analysis (SP)** Comparative analysis of foreign policy, with attention paid to explanations at a variety of levels, such as the individual, group, organizational, societal, systemic.

**PLSC4813 Politics of the Cold War (FA)** Examines the cold war from different perspectives; nature of the international system during the cold war; American and Soviet perceptions of the cold war; domestic political considerations; impact of the cold war on the economy, culture, and society; end of the cold war; the post-cold war world.

**PLSC4823 Foreign Policy of East Asia (SP)** This course provides an introduction to the international relations of two major East Asian states, China and Japan. Key topics include: China and Japan's interaction with the world political and economic systems; domestic sources of international behavior and major dimensions of foreign policy in the 1980s and 1990s.

**PLSC4843 The Middle East in World Affairs (SP)** 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.

**PLSC4873 Inter-American Politics (SP)** 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. Prerequisite: junior standing.

**PLSC4903 Democratic Theory (FA, SP, SU)** Analysis and comparison of classical and contemporary theories of democracy.

**PLSC498V Senior Thesis (1-6) (FA, SP, SU)**

**PLSC499VH Honors Essay (1-3) (FA, SP, SU)** Not part of the 30 hours requirement for the major. May be repeated for 6 hours.

**PLSC5103 Human Behavior in Complex Organizations (FA)** 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.

**PLSC5113 Seminar in Human Resource Management (SP)** 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.

**PLSC5123 Public Budgeting and Finance (FA)** Focuses on the budgeting process and governmental fiscal policy formulation, adoption, and execution. Prerequisite: graduate standing.

**PLSC5133 Management of Service Sector Organizations (SP)** 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.

**PLSC5143 Administrative Law (IR)** A seminar that 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 is the role, scope, and place of public regulatory activities. Prerequisite: graduate standing.

**PLSC5153 Environmental Politics and Policy (FA, Even years)** Surveys recent patterns of environmentalism in the U.S. and explores the nature of policy making

with regard to environmental and economic development issues. Several debates are presented, such as conservation vs. preservation, multiple use vs. sustainability, intergovernmental policy implementation, incentives, and free market environmentalism.

**PLSC5163 Public Policy (SP)** Research seminar examining the study of public policy making in complex human systems. Attention given to issues dealing with cognitive limitations in decisional settings, the use of reasoned persuasion vs. power, the appropriate application of technical analysis. Prerequisite: graduate standing.

**PLSC5183 Comparative Public Administration (IR)** A comparative study of administrative structures and processes in selected modern and modernizing political systems. Analysis includes the consideration of cultural, legal and political factors influencing the operation of bureaucratic institutions, developmental goals, and the methods of establishing and administering programs of social, economic and political development. Prerequisite: graduate standing.

**PLSC5193 Seminar in Public Administration (FA)** 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.

**PLSC5203 Seminar in American Political Institutions (FA)** Research seminar dealing with selected aspects of the major governmental institutions in the United States. Prerequisite: graduate standing.

**PLSC5213 Seminar in American Political Behavior (SP)** 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.

**PLSC5223 Seminar in Legislative Processes and Behavior (FA)** Research seminar dealing with legislative processes and behavior in the United States. Prerequisite: graduate standing.

**PLSC5233 Disability Policy in the United States (FA, SP, SU)** An analysis of public policy approaches to disability in the United States. Examines the political and philosophical origins of disability policy; reviews major disability legislation and its effects on policy stakeholders; describes recent policy initiatives; analyzes evolution of disability policy with context of changing societal, economic and political conditions. Prerequisite: graduate standing.

**PLSC5243 Seminar in State and Local Politics (FA, SP, SU)** Research seminar dealing with selected aspects of state and local institutions and politics such as comparative policy-making, political culture variations, and community power structures. Prerequisite: graduate standing.

**PLSC5383 Seminar in Political Communication (IR)** Research seminar focusing on selected topics such as candidate imagery, diffusion of political information, or political symbolism. (Same as COMM 5383) Prerequisite: graduate standing.

**PLSC5503 Comparative Political Analysis (FA)** A selection of topics to provide the theoretical, conceptual and methodological and foundation for the analysis of contemporary political systems. Prerequisite: graduate standing.

**PLSC5513 Seminar in Politics of the Middle East (FA, SP, SU)** 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.

**PLSC5523 Topics in Politics of the Middle East (FA, SP, SU)** In-depth analysis of specific political phenomena in the contemporary Middle East. Inquiry will vary but may focus on gender, political economy, politics of inclusion and exclusion (democratization and authoritarianism), or the politics of oil. Prerequisite: graduate standing.

**PLSC5563 Russian and Soviet Political Systems (SP)** Study of the political systems of the Soviet Union and the successor states. Prerequisite: graduate standing.

**PLSC5573 Political Change in Latin America (SP, Even years)** Research seminar analyzing obstacles to change in Latin America while utilizing both North American and Latin American research frameworks and techniques that deal with the theory and measurement of stability and development. Prerequisite: graduate standing.

**PLSC560V Teaching Foreign Cultures in Social Studies Curriculum (1-6) (SU)** Extensive examination

of foreign cultures (West Europe, USSR, China, Latin America) and methods of teaching about them in secondary school social studies. Four week residential summer institute. (Same as HIST 560)

**PLSC5803 Seminar in International Politics (FA)** 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.

**PLSC5833 Seminar in Contemporary Problems (FA)** Seminar with concentrated reading in selected and specialized areas of contemporary international relations. May be repeated for 6 hours. Prerequisite: graduate standing.

**PLSC5843 International Legal Order (SP)** 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.

**PLSC590V Directed Readings in Political Science (1-3) (FA, SP, SU)** May be repeated for 6 hours. Prerequisite: graduate standing.

**PLSC5913 Research Methods in Political Science (FA)** Methods relevant to research in the various fields of political science. Required of all graduate students in political science. Prerequisite: graduate standing.

**PLSC592V Internship in Political Science (1-6) (FA, SP, SU)** Internship in a local, state, regional, or federal agency. Paper required on a significant aspect of internship experience. Prerequisite: graduate standing.

**PLSC595V Research Problems in Political Science (1-3) (FA, SP, SU)** May be repeated for 6 hours. Prerequisite: graduate standing.

**PLSC5963 Modern Political Thought (FA)** European political thinking since the rise of the nation-state and the relevance of that tradition to contemporary politics. Prerequisite: graduate standing.

**PLSC5973 Contemporary Normative Political Theory (SP)** Analysis of current normative problems of political theory such as obligation, dissent, justification, sovereignty and tolerance, and major schools of thought including Marxism, liberalism and western conservatism. Prerequisite: graduate standing.

**PLSC600V Master's Thesis (1-6) (FA, SP, SU)**

**PLSC690V Directed Research (1-3) (FA, SP, SU)** Doctoral level directed readings and research. May be repeated for 6 hours.

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## (PORT) PORTUGUESE

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**PORT1003 Elementary Portuguese I (IR)** An introduction to basic Portuguese grammar with emphasis on listening comprehension and speaking skills.

**PORT1013 Intermediate Portuguese II (IR)** A continuation of PORT 1003. Prerequisite: PORT 1003 or equivalent.

**PORT2003 Intermediate Portuguese I (IR)** Review of basic grammar and further development of oral and reading skills.

**PORT2013 Intermediate Portuguese II (IR)** Continued development of basic speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: PORT 2003 or equivalent.

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## (POSC) POULTRY SCIENCE

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**POSC1003 Introductory Animal and Poultry Science (FA, SP)** The importance of animal and poultry production in American agriculture. Principles of production and management of livestock, poultry and their products. Lecture 3 hours per week.

**POSC1002L Introduction to Poultry Careers Laboratory (FA)** To expose the student to poultry career opportunities in the areas of science, business, production and processing. Efforts will be made to develop communication skills through written and oral and group activities. Lecture 1 hour, laboratory 3 hours per week.

**POSC1013 Exotic Companion Birds (FA)** Students will be introduced to the basic care, health, breeding and uses of many commonly kept exotic companion birds. Instruction will include basic bird evolution, anatomy and nutritional management needs of pigeons, raptors, parrots, game birds,

waterfowl, backyard and ornamental chickens, and ratties.

**POSC2353 Broiler and Turkey Production (FA)** Study of management practices used in production of young chickens, turkeys, and other poultry with special emphasis on broiler production. Lecture 2 hours, laboratory 3 hours per week. Corequisite: POSC 2350L.

**POSC2350L Broiler and Turkey Production Laboratory (FA)** Corequisite: POSC 2353.

**POSC2363 Breeder and Layer Management (SP)** Study of management practices used in production of adult chickens, turkeys, and other poultry with special emphasis on breeder and market egg production. Lecture 2 hours, laboratory 3 hours per week. Corequisite: POSC 2360L.

**POSC2360L Breeder and Layer Management Laboratory (SP)** Corequisite: POSC 2363.

**POSC2554 Poultry Biology (SP)** Detailed coverage of the external and internal anatomy of poultry including formation and development of the egg and embryo. Lecture 3 hours, laboratory 2 hours per week. Corequisite: POSC 2550L. Prerequisite: BIOL 1543.

**POSC2550L Poultry Biology Laboratory (SP)** Corequisite: POSC 2554.

**POSC3032 Animal Physiology I (FA)** Fundamental aspects of neural/muscle/bone tissues and the cardiovascular system. The normal structure and functions of these systems will be emphasized. Lecture 2 hours per week. (Same as ANSC 3032) Prerequisite: BIOL 1543 and CHEM 1123 or CHEM 1074.

**POSC3042 Animal Physiology II (SP)** Fundamental aspects of renal, respiratory, digestive, and endocrine physiology will be covered. The normal structure and function of these systems will be emphasized. Lecture 2 hours per week. (Same as ANSC 3042) Prerequisite: ANSC 3032 or POSC 3032.

**POSC3123 Principles of Genetics (FA)** Fundamentals of heredity, with special emphasis on the improvement of farm animals. Lecture 3 hours per week. (Same as ANSC 3123) Prerequisite: BIOL 1543 and BIOL 1541L and MATH 1203.

**POSC3223 Poultry Diseases (FA)** Common diseases affecting poultry reared under commercial conditions will be covered including diagnosis, therapy and prevention. Immunity, sanitation practices, and chemoprophylaxis will also be covered. Lecture 3 hours per week with some demonstrations, slides and videotapes. Prerequisite: MB O 2013 and MBI O 2011L and junior standing.

**POSC3382 Poultry Judging and Selection (FA)** Practice in production judging and flock selection. Laboratory 4 hours per week.

**POSC3391 Poultry Junior Judging Team Activity (SP)** Training for membership on judging teams, through participation.

**POSC400V Special Problems (1-9) (FA, SP, SU)** Special problems in the poultry sciences for advanced students.

**POSC401V Internship in Poultry Science (1-6) (FA, SP, SU)** Supervised work experience with private or government organizations to introduce students to professional areas of work in poultry science. May be repeated for 8 hours. Prerequisite: junior standing.

**POSC410V Special Topics in Poultry Science (1-4) (FA, SP, SU)** Topics not covered in other courses or for a more intensive study of specific topics in poultry science. May be repeated. Prerequisite: POSC 1003.

**POSC4213 Integrated Poultry Management Systems (SP)** 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. Prerequisite: POSC 2353.

**POSC4223 Risk Assessment for Biological Systems (FA, Odd years)** Principles of risk assessment including exposure assessment and dose response, and risk management. Methods of risk analysis modeling and simulation with computer software. Applications of risk analysis in animal, food and environmental systems. Prerequisite: STAT 2023 (or STAT 2303 or AGST 4023) and BENG 1022.

**POSC4314 Egg and Meat Technology (FA)** 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. Corequisite: POSC 4310L. Prerequisite: CHEM 1123 and CHEM 1121L and BIOL 1543 and BIOL 1541L.



**POSC4310L Egg and Meat Technology Laboratory (FA)** Hands-on experience and observations in the processing and development of egg and poultry meat products. Students will gain an understanding of the relationship between product quality and cooked poultry products, including the effects of processing conditions and protein functionality on value-added poultry products. Corequisite: POSC 4314.

**POSC4333 Poultry Breeding (FA, Odd years)** Application of new developments in poultry breeding for efficient egg and meat production. Lecture 3 hours per week. Prerequisite: (POSC 3123 or ANSC 3123) and junior standing.

**POSC4343 Poultry Nutrition (SP)** Principles of nutrition as applied to the formulation of practical chicken and turkey rations. Lecture 3 hours per week. Prerequisite: CHEM 2613 and CHEM 2611L and junior standing.

**POSC4391 Poultry Senior Judging Team Activity (FA)** Training for membership on judging teams, through participation.

**POSC4434 Fundamentals of Reproductive Physiology (FA)** Principles of avian reproductive physiology with emphasis on poultry. Lecture 3 hours, laboratory 3 hours per week. Corequisite: POSC 4430L. Prerequisite: POSC 1002L and POSC 3123.

**POSC4430L Fundamentals of Reproductive Physiology Laboratory (FA)** Corequisite: POSC 4434.

**POSC4743 Analytical Methods in Animal Nutrition (SP)** Experience in the techniques used in the modern animal nutrition laboratory and the interpretation of experimental data. Lecture 1 hour, laboratory 4 hours per week. (Same as ANSC 4743) Corequisite: POSC 4740L or ANSC 4740L. Prerequisite: CHEM 1123 and CHEM 1121L.

**POSC4740L Analytical Methods in Animal Nutrition Laboratory (SP)** Corequisite: POSC 4743.

**POSC4901 Undergraduate Seminar (SP)** Required by all poultry science majors. Prerequisite: junior standing.

**POSC500V Special Problems (1-6) (FA, SP, SU)** Work in special problems of poultry industry. Prerequisite: graduate standing.

**POSC510V Special Topics in Poultry Sciences (1-4) (IR)** Topics not covered in other courses or a more intensive study of specific topics in poultry science. May be repeated. Prerequisite: graduate standing.

**POSC5123 Advanced Animal Genetics (FA, Even years)** Specialized study of animal genetics. Lecture 3 hours per week. (Same as ANSC 5123) Prerequisite: POSC 3123 or ANSC 3123.

**POSC5122 Parasites of Poultry (SP, Odd years)** Lectures and discussions of the protozoan, helminth, and arthropod parasites of poultry. Emphasis is placed upon the significance of these parasites to the poultry industry. Topics covered include host-parasite relationships, life cycles, pathogenesis, epidemiology and management, immunology, chemotherapy, and practical methods of control. Lecture 1 hour, laboratory 2 hours per week. Corequisite: POSC 5120L.

**POSC5120L Parasites of Poultry Laboratory (SP, Odd years)** Practical investigations of the protozoan, helminth, and arthropod parasites poultry. Laboratory 2 hours per week. Corequisite: POSC 5122.

**POSC5143 Biochemical Nutrition (FA, Even years)** 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. (Same as ANSC 5143) Prerequisite: CHEM 3813.

**POSC5152 Protein and Amino Acid Nutrition (SP, Even years)** 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.

**POSC5313 Domestic Animal Bacteriology (FA)** A study of bacteria pathogenic for domestic animals. Lecture 3 hours per week.

**POSC5343 Advanced Immunology (SP)** 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.

**POSC5352L Immunology in the Laboratory (SP)**

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 MBI0 5343 or MBI0 4714.

**POSC5743L Advanced Analytical Methods in Animal Sciences Laboratory (FA)** Introduction into theory and application of current advanced analytical techniques used in animal research. Two 3-hour laboratory periods per week. Prerequisite: CHEM 3813 and PHYS 2013 and PHYS 2011 and (ANSC 4743 or POSC 4743).

**POSC5742 Advanced Poultry Diseases (FA)** The most important diseases of poultry will be covered in depth and the course will focus on understanding mechanisms of pathogenesis, diagnostic techniques and principles of prevention. Lecture/discussion 2 hours per week with Kodachrome slides and microscopic slides utilized. Prerequisite: POSC 3223.

**POSC5752L Advanced Poultry Diseases Laboratory (SP)** This course covers laboratory techniques utilized for the isolation, identification and diagnosis of poultry diseases with a microbial cause. Students will learn diagnostic virology, bacteriology, serology and mycology. Laboratories 3 hours twice weekly and then as needed to complete assignments. Prerequisite: POSC 3223 and POSC 5742.

**POSC5853 Advanced Meats Technology (SU, Even years)** 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. Lecture 2 hours, laboratory 2 hours per week. (Same as ANSC 5853) Prerequisite: ANSC 3614 or POSC 4314.

**POSC5901 Graduate Seminar (FA, SP)** Critical review of the current scientific literature pertaining to the field of poultry science. Oral reports. Recitation 1 hour per week. Prerequisite: senior standing.

**POSC5922 Neurophysiology of Domestic Animals (FA)** Neurophysiology, including mechanisms of nerve conduction, understanding of central integration and processing of signals with emphasis on cellular control mechanisms in domestic animals and poultry. Lecture 3 hours; drill 1 hour per week (for first 8 weeks of semester). (Same as ANSC 5922) Pre- or Corequisite: CHEM 3813. Corequisite: POSC 5920D. Prerequisite: ANSC/POSC 3032 and ANSC/POSC 3042.

**POSC5920D Neurophysiology of Domestic Animals Drill (FA)** Corequisite: POSC 5922.

**POSC5933 Environmental Physiology of Domestic Animals (FA, Odd years)** Study of the environment of domestic animals and its effect on physiological systems that affect maintenance, growth, production, and reproduction. Lecture 3 hours per week. (Same as ANSC 5933) Prerequisite: (ANSC 3032 or POSC 3032) and CHEM 3813.

**POSC5932 Cardiovascular Physiology of Domestic Animals (FA)** 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). (Same as ANSC 5932) Pre- or Corequisite: CHEM 3813. Corequisite: POSC 5930D. Prerequisite: ANSC/POSC 3032 and ANSC/POSC 3042.

**POSC5930D Cardiovascular Physiology of Domestic Animals (FA)** Corequisite: POSC 5932.

**POSC5942 Endocrine Physiology of Domestic Animals (FA)** 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). (Same as ANSC 5942) Pre- or Corequisite: CHEM 3813. Corequisite: POSC 5940L. Prerequisite: ANSC/POSC 3032 and ANSC/POSC 3042.

**POSC5940D Endocrine Physiology of Domestic Animals Drill (FA)** Corequisite: POSC 5942.

**POSC5952 Respiratory Physiology of Domestic Animals (SP)** 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. (Same as ANSC 5952) Pre- or Corequisite: CHEM 3813. Corequisite: POSC 5950D. Prerequisite: ANSC/POSC 3032 and ANSC/POSC 3042.

**POSC5950D Respiratory Physiology of Domestic Animals Drill (SP)** Corequisite: POSC 5952.

**POSC5962 Gastrointestinal/Digestive Physiology of Domestic Animals (SP)** 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). (Same as ANSC 5962) Pre- or Corequisite: CHEM 3813. Corequisite: POSC 5960D. Prerequisite: ANSC/POSC 3032 and ANSC/POSC 3042

**POSC5960D Gastrointestinal/Digestive Physiology of Domestic Animals Drill (SP)** Corequisite: POSC 5962.

**POSC5972 Renal Physiology of Domestic Animals (SP)** 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). (Same as ANSC 5972) Pre- or Corequisite: CHEM 3813. Corequisite: POSC 5970D. Prerequisite: ANSC/POSC 3032 and ANSC/POSC 3042.

**POSC5970D Renal Physiology of Domestic Animals Drill (SP)** Corequisite: POSC 5972.

**POSC600V Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**POSC6343 Vitamin Nutrition in Domestic Animals (SP, Even years)** 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. (Same as ANSC 6343) Prerequisite: (ANSC 3143 or POSC 4343) and CHEM 3813.

**POSC700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: graduate standing.

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## (PSYC) PSYCHOLOGY

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**PSYC2003 General Psychology (FA, SP, SU)** Introduction to basic procedures in the study of behavior and to the elementary principles of learning, motivation, emotion, sensation, and individual differences. Students will be expected to complete a research requirement.

**PSYC2003H Honors General Psychology (FA, SP, SU)** Introduction to basic procedures in the study of behavior and to the elementary principles of learning, motivation, emotion, sensation, and individual differences. Students will be expected to complete a research requirement.

**PSYC2013 Introduction to Statistics for Psychologists (FA, SP, SU)** Introduction to the descriptive and inferential statistics commonly used by psychologists. (Same as STAT 2013) Prerequisite: PSYC 2003.

**PSYC3013 Social Psychology (FA, SP, SU)** Introduction to the problems, theories, and experiments of social psychology. Prerequisite: PSYC 2003.

**PSYC3023 Abnormal Psychology (FA, SP, SU)** Causes and treatment of the major forms of abnormal behavior. Prerequisite: PSYC 2003.

**PSYC3033 Infancy and Early Childhood (FA, SP, SU)** Psychological factors influencing development from the prenatal period through 5 years of age. Emphasizes interaction of heredity and environmental influences on personality, perception, learning, motivation, cognition, and socialization. Prerequisite: PSYC 2003.

**PSYC3053 Psychology of Business and Industry (IR)** Application of psychological principles to the problems of business and industry with emphasis upon employee morale and attitudes, labor turnover, industrial relations, safety, fatigue, etc. Prerequisite: PSYC 2003.

**PSYC306V Special Readings and Projects (1-6) (FA, SP, SU)** For undergraduate majors in psychology. May be repeated.

**PSYC3073 Research Methods (FA, SP, SU)** Training in execution and interpretation of experiments using the classical experimental designs. Limited enrollment. Prerequisite: PSYC 2013.

**PSYC3083 Research in Applied Psychology (SP, Even years)** A lecture and laboratory course dealing with the application of psychological research methods to practical problems. Prerequisite: PSYC 3073.

**PSYC3093 Childhood and Adolescence (FA, SP, SU)** Psychological factors influencing development from age



6 to early adulthood, with emphasis on cognitive, personality, and psycho-social processes. Prerequisite: PSYC 2003.

**PSYC3103 Cognitive Psychology (SP)** Introduction to theories and research in cognition including memory, language, and problem-solving. Prerequisite: PSYC 2003.

**PSYC3183 Research in Human Learning (FA, Odd years)** A lecture and laboratory course dealing with the simpler forms of human learning. Prerequisite: PSYC 3073.

**PSYC3283 Research in Social Psychology (FA, Even years)** A lecture and laboratory course dealing with research methods commonly used in social psychology as well as experience involving the design, conduct, analysis, and presentation of research projects related to the processes discussed in lecture. Prerequisite: PSYC 3073.

**PSYC3383 Research in Developmental Psychology (FA, Odd years)** A lecture and laboratory course dealing with developmental research methods as well as selected research topics and laboratory experience involving the design, conduct, and analysis of research on selected developmentally-related problems. Prerequisite: PSYC 3073.

**PSYC3483 Research in Physiological Psychology (SP, Even years)** A lecture and laboratory course dealing with techniques for investigating the relationship between brain functions and behavior in both human and animal research. Students should expect to carry out a research project using laboratory rats. Prerequisite: PSYC 3073.

**PSYC3583 Research in Personality (SP, Odd years)** A lecture and laboratory course dealing with methodologies for the study of personality. Individual and/or group research projects including reviews of literature, application of methodology, and writing of reports will be conducted. Prerequisite: PSYC 3073.

**PSYC3683 Research in Perception (SP, Odd years)** Lecture and laboratory course dealing with research methods and experimental designs applied to the study of perception. Emphasis on application of psychological methods in the study of audition and vision. Prerequisite: PSYC 3073.

**PSYC3783 Research in Cognition (FA, Even years)** A lecture and laboratory course dealing with the design, conduct, and analysis of experiments in the area of memory, language, and other aspects of more complex human information processing. Prerequisite: PSYC 3073.

**PSYC3923H Honors Colloquium (IR)** Treats a special topic or issue, offered as part of the honors program. May be repeated when the content is changed. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in psychology).

**PSYC399VH Honors Course (1-6) (FA, SP, SU)** May be repeated for 12 hours. Prerequisite: junior standing.

**PSYC4013 Exceptional Children (IR)** Study of children whose development follows atypical patterns, including for example, the mentally deficient, the physically and emotionally handicapped. Prerequisite: PSYC 2003.

**PSYC4023 Adulthood and Aging (SP, Even years)** Psychological factors occurring from young adulthood through old age. Emphasis on cognitive, personality, physical, and psychological factors. Prerequisite: PSYC 2003.

**PSYC4033 Educational Psychology (IR)** Psychological theories and concepts applied to the educational process. Investigates the learner and instructional variables in a wide range of educational settings. Prerequisite: PSYC 2003.

**PSYC4053 Psychological Tests (FA)** Nature and theory of individual and group tests of intelligence, personality, interests, and attitudes. Prerequisite: PSYC 2013.

**PSYC4063 Psychology of Personality (SP)** Development and nature of the normal personality. Prerequisite: PSYC 2003.

**PSYC4073 Psychology of Learning (FA, SP, SU)** Basic principles of learning showing how these principles are derived from experimental studies and how they are applied to explain more complex forms of behavior. Prerequisite: PSYC 2003.

**PSYC409V Psychology Seminar (1-18) (IR)** Provides intensive coverage of specialized psychological topics.

**PSYC4123 Perception (FA)** Survey of principles and theories of sensation and perception. Content covers the classical senses with emphasis on integrating physical, physiological, and psychophysical evidence concerning the operation of sensory system in humans and other animals. Prerequisite: PSYC 2003.

**PSYC4133 Behavior Modification (SP, Odd years)** Introduction to the basic principles of behavior modification and contingency management. Presents procedures of

conditioning, reinforcement, token economy and self-control of individuals and groups in a variety of settings with emphasis on discussions of research and ethics. Prerequisite: PSYC 2003.

**PSYC4143 History and Systems of Psychology (FA)** Examination of the concepts, methods, and systems that have contributed to the development of modern psychology. Prerequisite: PSYC 2003.

**PSYC4183 Physiological Psychology (FA)** Examination of the biological basis of behavior. Surveys neuroanatomy, neurophysiology, and neuropharmacology, and then investigates how the nervous system produces various types of behavior. Prerequisite: PSYC 2003.

**PSYC4193 Comparative Psychology (SP)** Similarities and differences in behavior across different species, including man. Special reference is made to principles concerning the organisms adjustment to its environment. Prerequisite: PSYC 2003.

**PSYC498V Senior Thesis (1-6) (FA, SP, SU)**

**PSYC5013 Advanced Developmental Psychology (SP)** Critical examination of the research relevant to the psychological factors influencing the growth processes of the individual from birth to maturity. Prerequisite: PSYC 4073.

**PSYC5023 Neuropsychological Assessment (IR)** Introduction to the principles, techniques, and tools of assessment in clinical neuropsychology. Includes training in the interpretation, integration, and reporting of results. Prerequisite: PSYC 5043.

**PSYC5033 Psychopathology (FA)** 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. Prerequisite: PSYC 3023.

**PSYC5043 Assessment of Intellectual and Cognitive Abilities (FA)** Training in the theory, administration and interpretation of individual tests of intelligence and mental ability. Prerequisite: PSYC 4053.

**PSYC5053 Advanced Personality Assessment and Clinical Diagnosis (FA)** Guidelines for using standardized instruments and structured interviews in the diagnosis and clinical assessment of major psychological disorders. Includes training in the interpretation, integration, and reporting of results. Prerequisite: PSYC 5043 and PSYC 5163.

**PSYC5063 Advanced Social Psychology (SP)** Theory, methodology, and contemporary research in the major areas of social psychology. Topics include attitude theory and measurement, group processes, social and cultural factors.

**PSYC5073 Introduction to Clinical Practice: Core Skills and Ethical Guidelines (FA, SP)** (Formerly PSYC 507V) An introduction to clinical practice focusing on a) interview methods and techniques and b) ethical principles and guidelines.

**PSYC5113 Theories of Learning (FA)** Major concepts in each of the important theories of learning. Prerequisite: PSYC 4073.

**PSYC5123 Cognitive Psychology (SP, Even years)** Contemporary theories and research on human information processing including topics such as memory, language, thinking, and problem solving.

**PSYC5133 Inferential Statistics for Psychology (FA)** 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 or STAT 2013.

**PSYC5143 Advanced Descriptive Statistics for Psychology (SP)** 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.

**PSYC5163 Personality: Theory & Disorder (SP)** An introduction to empirically based theories of personality and personality disorders with an emphasis on clinical application and intervention.

**PSYC523V Research Practicum (1-3) (FA, SP)** Presentation

evaluation, and discussion of on-going research proposals. Required of all experimental graduate students in the first 2 years of their program.

**PSYC5313 Introduction to Clinical Science: Research Design and Ethical Guidelines (FA)** 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.

**PSYC600V Master's Thesis (1-6) (FA, SP, SU)**

**PSYC602V Seminar: Teaching Psychology (1-3) (FA, SP)** Survey of the literature on teaching of psychology in college. Includes: planning the course, method, examining and advising students. Prerequisite: teaching assistant.

**PSYC607V Clinical Practicum III (1-3) (FA, SP)** 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. Level of responsibility and independence to increase in 608V. Prerequisite: PSYC 507V and PSYC 508V.

**PSYC608V Clinical Practicum IV (1-3) (FA, SP)** 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. Prerequisite: PSYC 507V and PSYC 508V.

**PSYC609V Clinical Graduate Seminar (1-3) (FA, SP)** Provides intensive coverage of specialized clinical topics. Open to all graduate students.

**PSYC611V Individual Research (1-18) (FA, SP, SU)**

**PSYC6133 Advanced Physiological Psychology (FA)** Examination of the biological basis of behavior, with emphasis on underlying neural mechanisms.

**PSYC6163 Psychotherapy (SP)** A conceptual overview of psychotherapy, with an emphasis on a) common mechanisms, and b) cognitive and interpersonal approaches. Prerequisite: PSYC 5033.

**PSYC6173 Clinical Child Psychology (SP, Even years)** Intensive study of psychopathology, assessment, and treatment of children. Broad survey with emphasis on theory, practice, and research from a developmental perspective. Prerequisite: PSYC 5033 and PSYC 5043 and PSYC 5053.

**PSYC6183 Group Psychotherapy (FA, Even years)** Examination of theory, research, and practice in group psychotherapy.

**PSYC6203 Marital and Family Psychotherapy (FA, Odd years)** Examination of theory, research, and practice in marital and family psychotherapy. Includes supervised clinical experiences.

**PSYC6213 Behavior Therapy (FA, Even years)** Provides clinical experience and training in the major behavior modification technique. Includes also a critical evaluation of theory, research, and issues in the area.

**PSYC6223 Diversity Issues in Clinical Psychology (SP)** The impact of clients' diversity on assessment, treatment, and research in clinical psychology. Broad coverage with an emphasis on implications for clinical practice.

**PSYC6233 Professional Issues in Clinical Practice (IR)** Examination of major issues the professional practice of clinical psychology, including regulations governing licensure, the business of behavioral health care, and the role of clinical psychologists in the courts.

**PSYC6323 Seminar in Developmental Psychology (FA, Odd years)** 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).

**PSYC6353 Seminar in Learning/Memory/Cognition (SP, Odd years)** 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.

**PSYC6373 Seminar in Personality and Social Psychology (FA)** 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.

**PSYC6413 Seminar in Physiological Psychology (SP, Odd years)** 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.

**PSYC698V Field Work (1-3) (FA, SP, SU)** Provides

academic credit for field work in multidisciplinary setting, involving supervised experiences in assessment and psychotherapy. May be repeated.

**PSYC699V Clinical Psychology Internship (1-3)** (FA, SP, SU) Supervised experience in a multidisciplinary setting of assessment and psychotherapy. May be repeated.

**PSYC700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

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## (PTSC) PLANT SCIENCE

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**PTSC5343 Seed Physiology (SP)** Physiological process and molecular regulation in the development, dormancy, germination, and early growth of seeds. A basic knowledge of plants physiology expected.

**PTSC6101 Colloquium in Plant Sciences (SP)** Advanced discussion of topics in plant science on a participatory basis. Topics in plant pathology, horticulture and forestry will be treated. May be repeated for 2 hours. Prerequisite: graduate standing.

**PTSC6203 Laboratory Instrumentation in Plant Science (SP, Odd years)** Principles, capabilities, and operation of laboratory instrumentation utilized in plant science research. Lecture 2 hours, laboratory 3 hours per week. Corequisite: PTSC 6200L.

**PTSC6200L Laboratory Instrumentation in Plant Science Laboratory (SP, Odd years)** Corequisite: PTSC 6203.

**PTSC700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: graduate standing.

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## (PUBP) PUBLIC POLICY

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**PUBP 6012 Legal Research (FA)** This course examines primary and secondary level materials and techniques for effective legal research in print and electronic formats.

**PUBP 6023 Law and Public Policy (SP)** 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. Co- or Prerequisite: PUBP 6012.

**PUBP 6103 Policy Leadership Seminar (FA)** 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 inter agency settings.

**PUBP 6113 Agenda Setting and Policy Formulation (SP)** This course is a seminar on 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.

**PUBP 612V Research Problems in Policy (1-6)** (FA, SP, SU) May be repeated for 6 hours.

**PUBP 6134 Capstone Seminar in Public Policy (SP)** This course is intended to integrate various policy interested in a specific community based project.

**PUBP 6301 Policy and Administrative Ethics (SP)** This class will introduce the broad subject area of ethics in public administration and public policy.

**PUBP 700V Doctoral Dissertation (1-9) (I)** Prerequisite: candidacy.

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## (RDNG) READING

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**RDNG560V Workshop (1-18) (IR)**

**RDNG574V Internship (1-18) (IR)**

**RDNG605V Independent Study (1-6) (FA, SP, SU)**

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## (RECR) RECREATION

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**RECR1003 Professional Foundations of Leisure**

(FA) An analysis of the historical and philosophical development of recreation and leisure. Theories of play, recreation, and leisure are studied. Economic, political, technical, and social forces are examined as these influence recreation, parks, and leisure services is examined in context with diverse service delivery systems.

**RECR1001L Outdoor Recreation Laboratory (FA)**

An introductory course designed to teach students the skills and leadership techniques associated with several outdoor recreation activities including backpacking, camping, and orienteering. Includes a mandatory weekend trip outing.

**RECR1023 Recreation and Natural Resources**

(SP) An examination of the use and management of natural resources for outdoor recreation with consideration of multiple use, environmental ethics, risk management, and other current considerations. Several field visits will be required as part of the class, including a weekend outing.

**RECR201V Recreation Practicum (1-3) (FA, SP, SU)**

Students are assigned to assist in leisure-oriented programs for exposure to organizational structure, services, and programming of cooperating recreational agencies. Students may take 1-3 hours per semester; each credit hour is a 45-hour experience. Students must complete 3 different experiences before internship. May be repeated. Prerequisite: RECR 1003.

**RECR2063 The Commercial Recreation and**

**Tourism Enterprise (FA)** Examination of the commercial recreation and tourism industries. The operational requirement of a wide range of recreation businesses will be studied. Case study and field investigation methods will be emphasized.

**RECR2102 Hunter Education and Safety (FA)**

Provides the individual with knowledge and skill in the sport of hunting. Safety rules in both hunting and the use of firearms are stressed.

**RECR2813 Leadership Techniques in Recreation**

(FA) Development of knowledge related to leadership theory, group dynamics, and face-to-face leadership techniques. Students gain an understanding of leadership theories as they are applied in a field setting.

**RECR3002 Officiating Flag Football and**

**Volleyball (FA)** Provide the individual with the basic knowledge of sport rules and mechanics of officiating flag football and volleyball.

**RECR3012 Officiating Basketball, Softball, and**

**Baseball (SP)** Provide the individual with the basic knowledge of sport rules and mechanics of officiating basketball, softball, and baseball.

**RECR3833 Program Planning in Recreation (SP)**

Development of the fundamentals of program planning using modern techniques of identifying and analyzing program activity areas and community needs. Includes program development and application with a variety of population groups and representative leisure service areas. Prerequisite: RECR 1003 and RECR 2813.

**RECR3843 Planning, Design, and Maintenance**

**for Recreation (FA)** Planning concepts, design principles, and maintenance techniques are emphasized. Also, technical design concepts and firsthand experiences in maintenance of facilities are included. Prerequisite: RECR 1003 and RECR 3833.

**RECR3853 Leisure Behavior (FA)**

An examination of individual and group leisure behavior within a human development context. Identification and exploration of motivating factors related to various traditional and contemporary leisure expressions. Emphasis placed on application of leisure behavior concepts in the delivery of recreation programs and services.

**RECR3873 Sport and Recreation Risk Management**

(FA) In-depth look at risk management and related legal issues affecting recreation and sport administration. Prerequisite: RECR 3833 and junior standing.

**RECR4003 Innovative Practices in Recreation**

(SP) Management techniques for recreation programs and facilities. Prerequisite: RECR 3873.

**RECR4013 Contemporary Issues in Leisure (SP)**

Discussion of selected topics and review of current literature in the recreation field. Analysis of current trends and professional issues are emphasized. Certification at the instructor level or higher in at least 2 areas of expertise must be completed before a grade is assigned in this course. Prerequisite: senior standing.

**RECR405V Independent Study in Recreation (1-3)**

(FA, SP, SU) Provides student an opportunity to pursue special study of research problems. May be repeated.

**RECR4083 Research and Evaluation in Recreation**

(SP) An introduction to the applied methods and techniques of research and evaluation in leisure studies and services. General consideration given to research applications such as needs assessment, program evaluation, and marketing studies. Emphasis placed on the logic underlying the research process.

**RECR4093 Fundamentals of Therapeutic**

**Recreation (FA)** An introduction to the field of therapeutic recreation. This survey encompasses history, philosophy, programs, treatment, research, populations served, and professional aspects of therapeutic recreation practice.

Requirements are different for graduate credit. **RECR4263 Aquatic**

**Facilities Management (SP)** Prepares students to organize, administer, and supervise aquatic facilities, staff, and programs in school, community, and camp settings.

**RECR440V Internship (1-12) (FA, SP, SU)**

Prerequisite: RECR 3873.

**RECR4503 Seminar (FA, SP, SU)**

**RECR480V Workshop (1-3) (FA, SP, SU)**

**RECR5003 Graduate Prerequisites (FA)** Gives students entering a recreation degree program with no course background in recreation the necessary understanding of the recreation field. This course will not count toward a graduate degree in recreation.

**RECR5273 The Intramural Sports Program (FA)**

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.

**RECR5293 Sports Management (FA)** Deals primarily

with high school athletics and considers historical development, objectives, controlling agencies, eligibility and contest regulations, local organization and administration, staff program, finances, inventories, facilities and equipment, safety, legal aspects, awards, publicity, and public relations.

**RECR5433 Medical Aspects of Disability (FA)**

Orientation to medical and medically related aspects of various disabling conditions with emphasis on the severely disabled. (Same as RHAB 5433)

**RECR5453 Psychological Aspects of Disability**

(SP) Intensive study of the psychological aspects of adjustment to atypical physique and prolonged handicapping condition. (Same as RHAB 5453)

**RECR5473 Techniques in Therapeutic Recreation**

(SU) Advances the student's understanding and application of therapeutic recreation techniques. It provides knowledge and the opportunity to apply skills for the student to gain competencies necessary for the provision of therapeutic recreation services. Prerequisite: RECR 4093.

**RECR5483 Treatment Planning in Therapeutic**

**(SP)** Prepares students with the skills and understanding to apply the "TR Process" (assessment, planning, implementation, evaluation) in the development of individual client treatment plans in Therapeutic Recreation. Prerequisite: RECR 4093.

**RECR5493 Trends and Issues in Therapeutic**

**Recreation (SU)** Advances the student's knowledge of issues and concerns that moderate therapeutic recreation services to the client. The student is expected to critically examine and discuss each issue in an effort to develop a sound, practical philosophy of therapeutic recreation. The ultimate goal is to prepare the student to enter the profession confident in his or her ability to provide exemplary services. Prerequisite: RECR 4093.

**RECR560V Workshop (1-3) (IR)**

**RECR574V Internship (1-3) (IR)**

**RECR5813 Principles of Recreation (SU)** Considers history, philosophy, current trends, basic issues, and fundamental principles of recreation. Using these principles as basic criteria, students make critical appraisals of current practices in organization and administration of recreation programs, program content, leadership methods, and evaluative procedures.

**RECR5823 Outdoor Recreation Program (IR)**

Considers the values and scope of outdoor recreation programs. Attention is given to the influence of geographical factors, land use, standards, economics, and legislation on program planning and operation.

**RECR5833 Recreation for Special Populations**

(SP, SU) Skills, knowledge, and concepts within recreation that are appropriate to planning and implementing recreation programs and services for the handicapped.



**RECR5843 Tourism (FA)** Explores major concepts of tourism to discover what makes tourism work, how tourism is organized, and its social and economic effects.

**RECR5853 The School and Community Recreation Program (SP)** Nature, background, significance, and trends in recreation in the school and community. Attention is given to departmental organization, administrative practices, program financing, personnel, safety, and legal aspects.

**RECR5883 Recreation Services Promotion (SP)** Examines specific strategies for promoting recreation programs in the local community.

**RECR5893 Field Work in Recreation (FA, SP, SU)** Provides practical work experience in recreation programs and the opportunity to study special programs under the supervision of specialists.

**RECR599V Seminar (1-3) (IR)**

**RECR600V Master's Thesis (1-3) (FA, SP, SU)**

**RECR605V Independent Study (1-3) (FA, SP, SU)**

**RECR612V Directed Reading in Recreation (1-3) (FA, SP, SU)** Critical analysis of literature in the area of recreation.

**RECR6533 Legal and Political Aspects (SP)** An overview of major legislation affecting HKRD 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.

**RECR674V Internship (1-3) (FA, SP, SU)** Students will learn diverse teaching techniques and implement them in an on-going undergraduate recreation 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.

**RECR699V Seminar (1-3) (FA, SP, SU)** Discussion of selected topics and review of current literature in the recreation field. Prerequisite: advanced graduate standing.

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## (RHAB) REHABILITATION EDUCATION

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**RHAB5333 Counseling Persons Who Are Deaf or Hard of Hearing (FA, SP)** Focuses on the application of basic principles underlying all forms of therapeutic interaction to professional counseling practices with individuals who are deaf or hard of hearing.

**RHAB534V Supervised Rehabilitation Counseling (1-3) (FA, SP, SU)** Gives the student practice in counseling under supervision with rehabilitation clients in selected settings and agencies.

**RHAB5353 Hearing Impairment and Human Behavior (FA, SP)** Focuses on an interdisciplinary study of the impact of profound hearing loss on the educational, psychological, social, and vocational functioning of persons who are deaf or hard of hearing.

**RHAB5363 Employer Relations and Placement Practicum (FA, SP, SU)** Students address the placement needs of rehabilitation agencies and their clients by implementing the RehabMark approach to employer development. Prerequisite: RHAB 5493.

**RHAB5373 Multicultural/Gender Issues in Rehab (SU)** This course examines multicultural and gender issues of importance to rehabilitation practice and research, including study of women and men with disabilities within different minority cultures. The course uses a power analysis and a minority model of disability as a basis for understanding the relationship between disability, gender, race and ethnicity.

**RHAB5403 Rehabilitation Counseling (FA)** Counseling theories and techniques applied to the rehabilitation counseling setting. Includes an experiential component with critical analyses.

**RHAB5413 Group Counseling in a Rehabilitation Setting (SU)** This course combines theoretical and experiential components of group counseling in settings unique to the practice of rehabilitation counseling. Prerequisite: rehabilitation counseling or counseling theory.

**RHAB5423 Vocational Rehabilitation Foundations (FA)** Survey of the philosophy of vocational rehabilitation, including history and legislation.

**RHAB5433 Medical Aspects of Disability (SP)** Orientation to medical and medically related aspects of various disabling conditions with emphasis on the severely disabled.

**RHAB5443 Rehabilitation Case Management (SP)** Counseling process in the rehabilitation setting. Focusing upon effective counseling strategies, representative cases, and effective case management methods.

**RHAB5453 Psychological Aspects of Disability (SP)** Intensive study of the psychological aspects of adjustment to atypical physique and prolonged handicapping condition.

**RHAB5463 Independent Living and Community Adjustment (FA)** Study of the problems and practices involved in developing and maintaining independent living rehabilitation programs for people who are disabled physically, developmentally, and mentally.

**RHAB5473 Placement of Persons with Disabilities (SU)** Focuses on placement theory and practice as they apply to persons who experience disabilities. Special attention is given to RehabMark approach.

**RHAB5483 Rehabilitation Counseling Research (FA)** An in-depth examination of rehabilitation research methodology and issues to prepare students to critically evaluate and use rehabilitation counseling research in their professional practice.

**RHAB5493 Vocational Evaluation and Adjustment (SP)** An in-depth examination of theories and techniques related to: evaluation of vocational potential and work adjustment of people with disabilities.

**RHAB568V Rehabilitation Research (3-6) (FA, SP, SU)** Practical experience under the supervision of a faculty member in conducting rehabilitation research in a laboratory or field setting.

**RHAB574V Internship (1-9) (FA, SP, SU)**

**RHAB599V Seminar (1-18) (FA, SP, SU)**

**RHAB605V Independent Study (1-18) (FA, SP, SU)**

**RHAB6203 Disability Policy in the U.S. (FA)** 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; analyzes evolution of disability policy within context of changing societal, economic, and political conditions.

**RHAB6213 Advanced Psychosocial Aspects of Disability (FA)** A theoretical and applied study of techniques that enable people to cope with 2 major life events: disability and unemployment.

**RHAB6233 Employment Practices and Interventions (SP)** 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.

**RHAB6243 Advanced Rehabilitation Research (SP)** An advanced doctoral level course to facilitate the application of scientific values, research skills, and behavior to the generation of rehabilitation knowledge and problem solving.

**RHAB625V Teaching Internship in Rehabilitation (1-18) (FA, SP, SU)** Graduate teaching experience in the rehabilitation counseling curriculum. Under the supervision of a faculty member, will participate in the development of syllabi, course materials and examinations. Will team teach graduate rehabilitation courses with the faculty member. May be repeated for 18 hours.

**RHAB626V Practicum Supervision (1-3) (SU)** (Formerly RHAB 6263) The study and practice of supervising master's rehabilitation counseling students in a clinical practicum setting. May be repeated for 3 hours. Prerequisite: doctoral standing.

**RHAB6273 Administration & Supervision in Rehabilitation Settings (FA, Odd years)** An examination of the basic knowledge and skills required to perform supervisory and administrative functions in rehabilitation settings. Includes a review of applicable laws, management theory, issues in human resource development, burnout, and exposure to organizational structure and function. Prerequisite: master's or doctoral standing.

**RHAB675V Internship (1-18) (FA, SP, SU)** Advanced supervised practice a rehabilitation setting.

**RHAB699V Seminar (1-18) (FA, SP, SU)** Discussion of pertinent topics and issues in the rehabilitation field. May be repeated for 18 hours. Prerequisite: advanced graduate standing.

**RHAB700V Doctoral Dissertation (1-18) (FA, SP, SU)** Prerequisite: candidacy.

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## (RSOC) RURAL SOCIOLOGY

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**RSOC2603 Rural Sociology (SP)** Meaning of sociology and sociological concepts with reference to rural society; interdependence of rural and urban population in ecological areas; institutions; social change and adjustment.

**RSOC4603 Environmental Sociology (SP)** The course provides a social perspective on environmental issues. It examines the linkage among 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. (Same as SOCI 4603)

**RSOC4623 Introduction to Community Development (FA)** Introduction to the field of community development; including approaches used in Cooperative Extension Service, vocational agriculture, local governments, and the private sector. Focus is on the community development process. Prerequisite: RSOC 2603 or SOCI 2013.

**RSOC500V Special Problems (1-6) (FA, SP, SU)** Gives experience in executing research and in analyzing a sociological problem of agriculture. Prerequisite: graduate standing.

**RSOC5163 Agricultural and Rural Development (SU)** (First offered Summer 2001) Examination of agricultural and rural development issues in less developed countries. Alternative agricultural production systems are compared, development theories are examined, and consideration given to the planning and implementation of development programs. (Same as RSOC 5463) Corequisite: graduate standing and AGECE 1103 (or ECON 2023)

**RSOC5463 Research Methodology in the Social Sciences (SP, Odd years)** 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.

**RSOC5623 Advanced Community Development (SP)** Examination of the theories and applications of community development. Course is operated as a seminar, and covers a wide variety of community development applications. Prerequisite: RSOC 3613 or RSOC 4623 or equivalent.

**RSOC600V Master's Thesis (1-6) (FA, SP, SU)** Prerequisite: graduate standing.

**RSOC700V Doctoral Dissertation (1-9) (FA, SP, SU)**

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## (RSST) RUSSIAN STUDIES

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**RSST4003 Russian Studies Colloquium (SP)** An interdepartmental colloquium with an annual change in subject of investigation, required of all students in the Russian Studies program. May be repeated for 6 hours. Prerequisite: sophomore standing for Russian studies majors and honors students.

**RSST4003H Honors Russian Studies Colloquium (SP)**

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## (RUSS) RUSSIAN

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**RUSS1003 Elementary Russian I (FA)**

**RUSS1013 Elementary Russian II (SP)** Elementary courses stress correct pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: RUSS 1003 or equivalent.

**RUSS2003 Intermediate Russian I (FA)** Intermediate courses stress correct pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery of basic grammar and limited reading ability. Prerequisite: RUSS 1013 or equivalent.

**RUSS2013 Intermediate Russian II (SP)** Continued development of basic, speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: RUSS 2003 or equivalent.

**RUSS3013 Introduction to Literature (FA)** Development of reading skills and introduction to literary analysis. Prerequisite: RUSS 2013 or equivalent.



**RUSS3023 Listening Comprehension (SP)**

Provides intensive practice in listening to recordings taken from such sources as television broadcasts, lectures, and readings of literature. This is supplemented by conversation and by comprehension tests. Prerequisite: RUSS 2013 and RUSS 3013.

**RUSS4003 Advanced Russian I (FA, SP, SU)**

Advanced Russian reading, conversation, and composition. Review of grammar and syntax. Prerequisite: RUSS 3013.

**RUSS4013 Advanced Russian II (FA, SP, SU)**

Advanced Russian reading, conversation, and composition. Review of grammar and syntax. Prerequisite: RUSS 4003.

**RUSS4123 Survey of Russian Literature from Its Beginning to the 1917 Revolution (FA)**

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. (Same as WLIT 4123)

**RUSS4133 Survey of Russian Literature Since the 1917 Revolution (FA)**

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. (Same as WLIT 4133)

**RUSS470V Special Topics (1-3) (IR)** May be offered in a topic not specifically covered by courses otherwise listed. May be repeated for 6 hours.

**RUSS475V Special Investigations (1-6) (FA, SP)** May be repeated.

**RUSS575V Special Investigations (1-6) (FA, SP, SU)** May be repeated.

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## (SCWK) SOCIAL WORK

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**SCWK2133 Introduction to Social Work (FA, SP, SU)**

Introduction to social work as a profession and to social welfare institutions from the perspective of the generalist, entry level social worker. Emphasis on empowerment function of social work.

**SCWK3163 On Death and Dying (FA, SP, SU)**

Reviews the theory and humanistic importance of the concepts of death and dying in society. An experimental option and interdisciplinary faculty presenters will be part of the format. Prerequisite: junior standing.

**SCWK3183 Elderly Citizen (SP, SU)** Survey of theories of gerontology, service programs and unmet needs of the aging citizen.

**SCWK3193 Human Diversity and Social Work (FA, SP, SU)**

An introduction to information basic concepts related to human diversity and social work. Provides content on differences and similarities in the experiences, needs, and beliefs of people distinguished by race, ethnicity, culture, class, gender, sexual orientation, religion, physical or mental ability, age or national origin. Prerequisite: SCWK 2133.

**SCWK3233 Juvenile Delinquency (FA, SP, SU)**

Nature, causes, extent, and methods of treatment of juvenile delinquency. Prerequisite: junior standing.

**SCWK3533 Legal Aspects of Social Welfare (FA)**

Study of a selected group of legal regulations encountered by the social worker, including the court system, legal rights of indigent persons and children, domestic relations, problems of the small wage earner, and health measures. Prerequisite: junior standing.

**SCWK3633 Problems of Child Welfare (FA, SP, SU)**

Study of the needs of deprived children with some attention to methods and standards of care. Cultural competence and family-centered practice are emphasized. Prerequisite: junior standing.

**SCWK3923H Honors Colloquium (IR)**

Treats a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in social welfare).

**SCWK399VH Honors Course (1-6) (IR)**

May be repeated for 12 hours. Prerequisite: junior standing.

**SCWK405V Special Topics in Social Work (1-6) (IR)**

Comprehensive study of various topics of importance in contemporary social welfare and social work practice. May be repeated. Prerequisite: junior standing.

**SCWK4073 Social Work Research and Technology I (FA, SP)**

(Formerly SCWK 3073) 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. Prerequisite: three hours of statistics and computer literacy.

**SCWK4093 Human Behavior and the Social Environment I (FA, SP, SU)**

(Formerly SCWK 3093) 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. Prerequisite: BIOL 1543, BIOL 1541L, PSYC 2003, SOCI 2013, SCWK 2133, and SCWK 3193.

**SCWK4103 Human Behavior and the Social Environment II (FA, SP)**

(Formerly SCWK 3103) 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. Prerequisite: SCWK 4093.

**SCWK4133 Family Preservation (SP)** An introduction to the fundamentals of family preservation services. Emphasis is on learning the components, implications, and techniques of the family preservation model. Strategies for helping the multiproblem family are stressed.

**SCWK4143 Addiction and the Family (SP, SU)**

Introduction to the biophysical basis of chemical and behavior compulsions with special focus on family impacts. Childhood development within addictive families is also examined. Social work intervention with substance abusing families is highlighted.

**SCWK4153 Social Welfare Policy (FA, SP, SU)**

(Formerly SCWK 3153) 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. Prerequisite: PLSC 2003, ECON 2143, SCWK 2133, and SCWK 3193.

**SCWK4233 Seminar: Children and Family Services (FA, SP, SU)**

An examination of selected current issues in the field of children and family services through discussion, individual study, and interaction with professionals in the field.

**SCWK4333 Social Work Practice I (FA, SP)**

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. Pre- or Corequisite: SCWK 4093.

**SCWK4343 Social Work Practice II (FA, SP)**

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. Pre- or Corequisite: SCWK 4103. Prerequisite: SCWK 4333

**SCWK4412 Field Seminar I (FA, SP, SU)**

An integrative seminar to assist students in comparing their practice experiences, integrating knowledge acquired in the classroom, and expanding knowledge beyond the scope of the practicum setting. Corequisite: SCWK 4434 and social work majors only.

**SCWK4422 Field Seminar II (FA, SP, SU)**

An integrative seminar to assist students in comparing their practice experiences, integrating knowledge acquired in the classroom, and expanding knowledge beyond the scope of the practicum setting. Corequisite: SCWK 4444 (social work majors only).

**SCWK4434 Social Work Internship I (FA, SP, SU)**

Arranged in connection with social service agencies. Credit is based on completion of all course objectives, including a minimum of 225 hours of field work under the supervision of a licensed social worker. Corequisite: SCWK 4412 (social work majors only). Prerequisite: SCWK 3073 and SCWK 3103 and SCWK 4333.

**SCWK4444 Social Work Internship II (FA, SP, SU)**

Arranged in connection with social service agencies. Credit is based on completion of all course objectives, including a minimum of 225 hours of field work under the supervision of a licensed social worker. Corequisite: SCWK 4422 (social work majors only). Prerequisite: SCWK 4343 and SCWK 4733 and SCWK 4434 and SCWK 4432.

**SCWK4633 Information Technology and the Human Services (FA, SP, SU)**

Overview of information technology and exposure to human service applications

through lecture and lab experience. Prerequisite: SCWK 2133.

**SCWK4733 Social Work Practice III (FA, SP)**

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. Pre- or Corequisite: SCWK 4343. Prerequisite: SCWK 4103 and SCWK 4333.

**SCWK496V Independent Study (1-6) (FA, SP, SU)**

Independent Study designed to meet the particular needs of individual students. May be repeated for 6 hours.

**SCWK5003 Foundations of Culturally Competent Social Work Practice (FA)**

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.

**SCWK5013 Culturally Competent Social Work Practice (SU)**

This course prepares advanced standing MSW students for graduate study. Students will become familiar with the mission and conceptual framework undergirding the School of Social Work, become familiar with and choose an area of emphasis, and develop beginning knowledge of diagnosis. Corequisite: SCWK 5444 and SCWK 5442. Prerequisite: admission into the advanced standing MSW program.

**SCWK5073 Social Work Research and Technology II (FA)**

This course includes content necessary for thesis proposal development. A significant component for this course focuses on using research tools to begin the thesis. The course provides an orientation to participatory action research, and to the scientific and systematic evaluation of service delivery and personal professional practice.

Corequisite: SCWK 6000L and SCWK 6003. Prerequisite: completion of year one for two-year students or summer semester for advanced standing students.

**SCWK5143 Global Social and Economic Justice and Oppression (FA)**

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.

**SCWK5153 Children, Youth, and Family (FA, SP, SU)**

This course focuses on the development, revision, and impact of policy and practice in children, youth, and family services. Current issues in policy and practice will be examined. Students will interact with community agencies and utilize class assignments to advocate improvements in current policy and practice. Prerequisite: SCWK 5003 or SCWK 5013.

**SCWK5173 Advanced Practice with Families and Couples (FA)**

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 so

al systems and life-course strengths approaches to understand how families and couples function. Students will design interventions. Prerequisite: SCWK 5003 or SCWK 5013.

**SCWK5183 Advanced Practice with Individuals (SP)**

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.

**SCWK5193 Advanced Practice and Policy in Aging (FA)**

This course focuses on social work practice with, and policies for, older persons. Current, past, and future practices and policies for older persons across systems and the life course are explored. Emphasis is placed on the influences of personal, social, economic, and cultural diversity on the well-being of older persons. Prerequisite: SCWK 5003 or SCWK 5013.

**SCWK5213 Advanced Practice and Policy in Mental Health (SP)**

This advanced course prepares students to identify mental disorders, plan intervention strategies with clients from a strengths perspective, and understand mental health programs and policies 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.

**SCWK5223 Advanced Practice and Policy in Health Care (FA)** This course examines the delivery of health care in the United States in the context of social, political, economic, ethical, and legal factors. Students gain skills for collaboration on an interdisciplinary team. Prerequisite: SCWK 5003 or SCWK 5013.

**SCWK5233 Advanced Technology for Social Work (FA)** This course develops advanced skills in the critical evaluation and use of information technologies for social work practice. Emphasis is placed on using technological advances to enhance the effectiveness of social work practice across multiple systems, and developing skills for life-long learning about technologies in a rapidly changing information age. Prerequisite: SCWK 5003 or SCWK 5013.

**SCWK5253 Spiritually in Social Work (FA, SP)** This course provides a framework of knowledge, values, skills and experiences for spiritually-sensitive social work practice. It prepares students to respond competently and ethically to diverse spiritual and religious perspectives by using a comparative, critically reflective approach to content. Prerequisite: SCWK 3103 or SCWK 5003 or SCWK 5013.

**SCWK5343 Advanced Practice with Groups (SP, SU)** 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.

**SCWK5412 Foundation Field Seminar (SP)** 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.

**SCWK5434 Foundation Field Internship (SP)** 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 4333, SCWK 4073, SCWK 4093, and SCWK 4153.

**SCWK5444 Field Internship III (SU)** 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.

**SCWK5442 Field Seminar III (SU)** 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.

**SCWK6003 Life Course Multi-System Social Work I (FA)** In this first course of a two-semester sequence, students select a community problem, provide services to clients, and address the problem through policy analysis. A review of literature regarding theory and practice, paradigm analysis, development of a practice model, and implementation of micro and mezzo interventions in the field are examined. Corequisite: SCWK 6444, SCWK 6442, and SCWK 5073. Prerequisite: completion of year one for two-year students, or summer semester for advanced standing students.

**SCWK6000L Thesis Laboratory (SP, SU)** Corequisite: SCWK 5073 and SCWK 6073.

**SCWK6013 Life Course Multi-System Social Work II (SP)** In this second of a two-course sequence students provide services to social work clients. This course covers application of life course theory and multi-system and diversity perspectives. Issues across the life course are considered in addressing interventions through program development, a grant proposal submission, and implementation of macro interventions. Corequisite: SCWK 6073, SCWK 6454, and SCWK 6452. Prerequisite: SCWK 6003.

**SCWK6073 Social Work Research and Technology III (SP)** In this final research course, students collect and analyze data as planned in the thesis proposal submitted for Research and Technology II. Course content focuses on the advanced research skills necessary to complete the thesis. Students write a research report of their findings and submit it for publication. Corequisite: SCWK 6013 and SCWK 6000L. Prerequisite: SCWK 5073.

**SCWK6444 Advanced Field Internship I (FA)** 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.

**SCWK6442 Advanced Field Seminar I (FA)** 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.

**SCWK6454 Advanced Field Internship II (SP)** 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.

**SCWK6452 Advanced Field Seminar II (SP)** 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.

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## (SEED) SECONDARY EDUCATION

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**SEED4223 Teaching of Mathematics (FA, SP, SU)**

**SEED560V Workshop (1-18) (IR)**

**SEED599V Seminar (1-18) (IR)**

**SEED600V Master's Thesis (1-18) (IR)**

**SEED605V Independent Study (1-18) (FA, SP, SU)**

**SEED660V Workshop (1-18) (IR)** Prerequisite: advanced graduate standing.

**SEED674V Internship (1-18) (IR)** Prerequisite: advanced graduate standing.

**SEED680V Educational Specialist Project (1-6) (IR)**

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## (SOCI) SOCIOLOGY

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**SOCI2013 General Sociology (FA, SP, SU)** Group relations, culture, personality, social institutions, collective behavior, and social change.

**SOCI2013H Honors General Sociology (FA, SP, SU)** Group relations, culture, personality, social institutions, collective behavior, and social change.

**SOCI2033 Social Problems (FA, SP, SU)** Social disorganization, social strains, and deviant behavior, including consideration of war, poverty, ethnic relations, delinquency, drug addiction, mental illness, and population problems.

**SOCI2043 Marriage and the Family (FA)** A sociological analysis of courtship, marriage, and parenthood patterns including gender relations in and diverse forms of contemporary American families.

**SOCI3013 Population and Society (SP, Odd years)** The social significance of population; population distribution and composition; population trends; and problems of the population.

**SOCI3023 Criminology (FA, SP, SU)** A survey of theories of crime causation, development of law, corrections, victimization, and police and policy. (Same as CMJS 3023) Prerequisite: SOCI 2013 or SOCI 2033.

**SOCI3033 American Minorities (FA)** A sociological approach to the study of the culture, lifestyles, contemporary issues and the psycho-social well-being of minority groups in America. Prerequisite: SOCI 2013.

**SOCI3043 Contemporary Caribbean (SP)** The background, development, social organization, problems, and prospects of the contemporary people of the Caribbean Islands and related territories.

**SOCI3103 Religion and Society (SP)** Comparative study of religious organization, beliefs, practitioners, and rituals. Examination of major social science issues in the study of religion. (Same as ANTH 3103)

**SOCI3123 Sociology of Work (SP)** Study of the social organization of work, changing work roles, theories of work.

**SOCI3133 Urban Structure and Change (FA)** Static and dynamic nature of urban structure and the role of space

as social factor with attention on efforts to revitalize residential neighborhoods in central city areas. Prerequisite: junior standing.

**SOCI3153 Urban Sociology (FA)** The processes of urbanization; the nature of urban social organization; the impact of urban culture on non-urban society; implications for policy and planning; including study of foreign as well as American communities. Prerequisite: SOCI 2013.

**SOCI3193 Race, Class, and Gender in America (FA)** Introduction to sociological theories and research on social inequality in the United States. Course focuses on the three prominent lines of social division in this society: class, gender, and race. Prerequisite: SOCI 2013.

**SOCI3203 Corrections (FA)** A study of the origins, development, and practices related to corrections, including incarceration, community corrections and supervision, and intermediate sanctions. (Same as CMJS 3203) Prerequisite: CMJS 2003.

**SOCI3223 Social Psychology (FA)** Current theories and research in social interaction, with emphasis on symbolic processes, role theory, theories of interpersonal behavior, socialization, and the relation of institutional structures to individual behavior. Prerequisite: SOCI 2013.

**SOCI3233 Collective Behavior (FA, SU)** Emergent non-institutional groups, such as crowds, public and social movements, their genesis, process, effect, termination, and control. Prerequisite: SOCI 2013.

**SOCI3253 Cultures of the South (SP)** Survey of the diverse ethnic and racial groups of the American South with special emphasis on social and cultural traits related to contemporary developments. (Same as ANTH 3253)

**SOCI3303 Social Data and Analysis (FA, SP)** An introduction to descriptive and inferential statistics with special emphasis on those techniques most commonly used in social research. Corequisite: SOCI 3301L. Prerequisite: SOCI 2013.

**SOCI3301L Social Data and Analysis Laboratory (FA, SP)** Applied statistics lab to accompany SOCI 3303. Corequisite: SOCI 3303.

**SOCI3313 Social Research (FA, SP)** Study and experience in current methods of social research with emphasis on sociological measurement and design. Prerequisite: SOCI 2013 and SOCI 3303.

**SOCI3333 Anthropology of Ethnicity (SP)** Anthropological approaches to the study of race and ethnicity, with reference to other models such as gender, nation, and class. Case studies drawn from Western and non-Western societies, and from pre-colonial and post colonial periods. (Same as ANTH 3333)

**SOCI3723 Deviant Behavior (FA)** Prevalence, theories, stereotypical responses, and treatment programs for behaviors such as vagrancies, alcoholism, violence, and sexual deviancy that deviate from social norms.

**SOCI3923H Honors Colloquium (IR)** Covers a special topic or issue, offered as part of the honors program. May be repeated. Prerequisite: honors candidacy (not restricted to candidacy in sociology).

**SOCI399VH Honors Course (1-6) (FA, SP)** May be repeated for 12 hours. Prerequisite: junior standing.

**SOCI4003 Internship in Sociology (FA, SP, SU)** (Formerly SOCI 4006) Supervised experience in municipal, county, or state agencies, or any other agency that is approved by the instructor. Prerequisite: SOCI 2013.

**SOCI4001 Proseminar in Sociology (IR)** Forum for students and faculty to present and discuss research interests.

**SOCI401V Special Topics in Sociology (1-6) (SP)** Designed to cover specialized topics not usually presented in regular courses. May be repeated for 6 hours. Prerequisite: SOCI 2013.

**SOCI4023 Social Theory (FA)** Nineteenth and 20th century sociological theory. Present-day currents in sociology are studied and related to political, philosophical, and psychological contemporary thought. Prerequisite: SOCI 2013 and junior standing.

**SOCI403V Individual Study in Sociology (1-3) (FA, SP, SU)** A reading and conference course on special topics in sociology for advanced students.

**SOCI4043 Seminar in Sociology (SP)** Prerequisite: senior standing.

**SOCI4053 Political Sociology (IR)** Analysis of political institutions and movements in relation to power, social class, ideology, and related variables.

**SOCI4063 Organizations in Society (FA)** An introduction to the study of organizations; provides a broad overview of issues and problems related to organizations in society. Prerequisite: SOCI 2013



**SOCI4073 Peoples of East Africa (FA)** The major institutional structures, dynamics and problems of the Africans, Asians, and Europeans of contemporary Uganda, Kenya, Tanzania, Somalia, Sudan, and Ethiopia. Prerequisite: SOCI 2013.

**SOCI4083 Sociology of Medicine (IR)** The sociological characteristics of sickness to include primitive medicine, the evolution of medicine, the organization of medical care, the relation between disease and the social environment, and the impact of ill health on society. Prerequisite: SOCI 2013.

**SOCI4093 Sociology of Poverty (FA, Even years)** The incidence and composition of poverty: educational and economic strategies for attacking poverty problems. Prerequisite: SOCI 2013.

**SOCI4123 Black Ghetto (FA, SP)** The origin, continuity, problems, and personalities, of the Black American community and its contributions to national and international life. Prerequisite: SOCI 2013.

**SOCI4133 The Family (SP)** A sociological analysis of the interactions and relationships that constitute the family as a group and as an institution, to include issues of gender and family diversity. Prerequisite: SOCI 2013 or SOCI 2033.

**SOCI4163 Extremism (SP)** Descriptions of, explanations for, religious cults and extremist political groups in America, including question(s) of appropriate response to them. Prerequisite: junior standing.

**SOCI4203 Gender and Society (SP)** Variations in gender roles, self-concepts and societal expectations, by generation, social class, and ethnic group; the present and changing statuses of men and women in society. Prerequisite: SOCI 2013 or HUMN 2003.

**SOCI4213 Seminar in Violence (IR)** Explanations for, consequences of, and possible responses to individual, collective, and institutional violence; comparisons between socially acceptable and unacceptable forms of violence. Prerequisite: junior standing.

**SOCI4313 Language and Society of Japan (FA)** 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. (Same as AIST 4313, COMM 4313) Prerequisite: junior standing.

**SOCI4603 Environmental Sociology (SP)** 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.

**SOCI500V Advanced Problems in Sociology (1-6)** (FA, SP, SU) Individual research on problems or problem areas. Prerequisite: graduate standing.

**SOCI5013 Advanced Social Research (FA)** Supervised field experience and other projects in social research. Prerequisite: SOCI 2013 and SOCI 3301L and SOCI 3303 and SOCI 3313.

**SOCI5023 Sociology of Education (IR)** Sociological theory and research relevant to education, the school as a social system, professionalization and career patterns of teachers, value conflicts, social stratification, role relationships, and other factors. Prerequisite: graduate standing.

**SOCI5053 Advanced General Sociology (IR)** Advanced survey of the discipline and profession of sociology, including designation of the subject matter of sociology and relation to other disciplines, models of society and people, social units and social processes, methods, and sociology as a profession. Prerequisite: graduate standing.

**SOCI5083 Methods of Field Research (SP)** 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.

**SOCI5113 Seminar in Social Inequality (FA)** Major theories of stratification; types of stratification systems, comparisons of modern and traditional systems; emergent trends. Prerequisite: SOCI 4023 or SOCI 5053.

**SOCI5133 Contemporary Community Systems (SP, Even years)** Community human and physical systems and their relationships in a changing environment, quantitative evaluation of essential public services. Prerequisite: graduate standing.

**SOCI5153 Sociological Perspective on Social Psychology (SP)** Principles, concepts and methods used in analyzing effects of social structures and processes on the self and interaction. Topics include exchange theory, role analysis, symbolic interactionism, social construction of reality, socialization, interpersonal competence, organizational and leadership development, social dislocation, and stress. Prerequisite: graduate standing.

**SOCI5173 Seminar in Social System Model Construction (IR)** Methods and on-going research examples of data-based model construction for social system analysis. Emphasis on practical student projects in model construction and verification. Prerequisite: STAT 4003 or STAT 4033 or equivalent.

**SOCI5233 Theories of Deviance (FA, Even years)** 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.

**SOCI5253 Classical Social Theory (FA)** 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.

**SOCI5263 Contemporary Social Theory (SP)** 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: SOCI 5253.

**SOCI5313 Applied Data Analysis (SP)** 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: SOCI 3303 or an equivalent course in statistics. Familiarity with statistical computer programs is assumed.

**SOCI5311L Applied Data Analysis Laboratory (SP)** 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. Corequisite: SOCI 5313. Prerequisite: SOCI 3303 and SOCI 3301L.

**SOCI5403 Survey Methods (IR)** Introduction to techniques of social survey research. Focuses on the development of survey research instruments and their construction. Measurement techniques are examined including issues of reliability and validity, scaling, and index construction. Elementary sampling considerations are discussed in the applied context of research. Techniques of file generation and manipulation relative to survey research are examined. Prerequisite: SOCI 3303 or equivalent.

**SOCI5506 Research Internship (FA, SP)** Supervised research experience in field setting. Prerequisite: graduate standing.

**SOCI600V Master's Thesis (1-6)** (FA, SP, SU)

**SOCI6043 Public Policy, Children and Families (IR)** The study of the impact of public policy on children and families, and the ways in which policies are created, modified, and changed. Includes the history of public policy concerning children and families.

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## (SPAN) SPANISH

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**SPAN1003 Elementary Spanish I (FA, SP)**

**SPAN1016 Intensive Elementary Spanish (FA)** Equivalent to 1003 and 1013. Stresses aural comprehension and practical speaking ability. Reading, writing, and grammar in support of communication skills.

**SPAN1013 Elementary Spanish II (FA, SP)**

Elementary courses stress pronunciation, aural comprehension, and simple speaking ability, and lead to active mastery basic grammar and limited reading ability. Prerequisite: SPAN 1003 or equivalent.

**SPAN2003 intermediate Spanish I (FA, SP)**

Intermediate courses lead to greater facility in spoken language and to more advanced reading skills. Prerequisite: SPAN 1013 or equivalent.

**SPAN2016 Intensive Intermediate Spanish (SP)**

Equivalent to 2003 and 2013. Stresses aural comprehension and practical speaking ability. Reading, writing, and grammar in support of communication skills. Prerequisite: SPAN 1013

or equivalent.

**SPAN2013 Intermediate Spanish II (FA, SP)**

Continued development of basic speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: SPAN 2003 or equivalent.

**SPAN2013H Honors Intermediate Spanish II (FA, SP)** Continued development of basic speaking comprehension and writing skills and intensive development of reading skills. Prerequisite: SPAN 2003 or equivalent.

**SPAN3003 Advanced Spanish (FA, SP)** Further intensive practice to strengthen written and oral expression. Includes a review of the essentials of Spanish grammar. Prerequisite: SPAN 2013 or equivalent.

**SPAN3033 Conversation (FA, SP, SU)** Three hours per week of guided conversation practice for the post-intermediate student. Prerequisite: SPAN 3003.

**SPAN3063 Intensive Spanish Reading I (SU)** A rapid course in the fundamentals of Spanish for advanced students who do not desire to follow the usual curriculum Spanish in the shortest possible time.

**SPAN3103 Cultural Readings (FA, SP)** A course designed to build vocabulary and to strengthen reading skills and oral expression through extensive practice with culturally authentic materials. Prerequisite: SPAN 2013 or equivalent.

**SPAN3113 Introduction to Literature (FA, SP)** Further development of reading skills and introduction to literacy commentary and analysis. Prerequisite: (SPAN 3003 and SPAN 3103) or equivalent.

**SPAN399VH Honors Spanish Course (1-6) (FA, SP)** May be repeated for 12 hours. Prerequisite: junior standing.

**SPAN4003 Advanced Grammar (SP)** For majors and advanced students covering the problematic areas of Spanish syntax and usage. Prerequisite: SPAN 3003 and SPAN 3103.

**SPAN4033 Advanced Conversation (SP)** Three hours per week of conversation practice for the advanced undergraduates. Prerequisite: SPAN 3033 and SPAN 4003.

**SPAN4063 Applied Linguistics: Phonetics and Phonology (SP)** Prerequisite: SPAN 3003.

**SPAN4103 Monuments of Spanish Literature (FA)** Survey of the major works of Spanish literature from El Cid through the 20th century. Prerequisite: SPAN 3113.

**SPAN4133 Survey of Spanish-American Literature (SP)** Monuments of Spanish-American literature from the Colonial period to the present, with a concentration on the period from 1888 to the present. Prerequisite: SPAN 3113.

**SPAN4213 Spanish Civilization (SP)** A wide-ranging exploration of Spanish history and culture from the Middle Ages to the present. Prerequisite: SPAN 3113.

**SPAN4223 Latin American Civilization (FA)** Prerequisite: SPAN 3113.

**SPAN4233 Modern Mexico: Culture & Society (FA, SP, SU)** A wide-ranging exploration of culture and society in Mexico today, its unity and diversity, as tradition confronts the processes of modernization and globalization. Includes an historical survey, but focuses on contemporary issues, such as relations with U.S. This course will be taught in Spanish. Prerequisite: SPAN 3113.

**SPAN4243 Literature and Culture in the Hispanic United States (FA, SP, SU)** An exploration of the history and culture, art and politics of the major Hispanic groups in the United States. Focus on contemporary attitudes and issues. Prerequisite: SPAN 3113.

**SPAN4253 Latin American Cinema and Society (IR)** This course examines key issues in Latin American culture and history through films, documentaries, and literary and cultural texts. Topics included are: Human Rights, Ethnicity, Gender, Revisions of the past. Prerequisite: SPAN 3113.

**SPAN4333 Business Spanish I (SP)** Enhances ability to relate to Spanish-speaking business environments by providing a solid foundation in vocabulary and discourse related to functional business areas such as organization of a company structure, management, banking and accounting, capital investment, personnel and office systems, production of goods and services, marketing, finance, and import-export. Prerequisite: SPAN 3003.

**SPAN4433 Business Spanish II (SP)** Reinforces concepts and vocabulary covered in SPAN 4333 and further enhances ability to function in a Spanish-speaking environment by providing instruction in the preparation of written documents such as form letters, communiques, letters of credit, contracts, memoranda, letters of recommendation, dossiers, and order forms. Prerequisite: SPAN 4333.



**SPAN470V Special Topics (1-3) (IR)** May be offered in a topic not specifically covered by courses otherwise listed. May be repeated for 6 hours.

**SPAN475V Special Investigations (1-6) (FA, SP)** May be repeated.

**SPAN5003 Workshop in Advanced Intensive Spanish (IR)** Improvement of language proficiency in areas of listening and speaking. Includes a review of grammar, phonetics, and vocabulary (with cultural enrichment) as needed, with stress on oral practice and presentation. Prerequisite: adequate functional use of the language.

**SPAN5013 Advanced Stylistics and Composition (IR)** Systematic review of principles of Spanish grammar and syntax and the development of writing skills. Focus on methods of teaching Spanish grammar.

**SPAN5203 Medieval Spanish Literature (IR)** From the 'Jarchas' to the Celestina.

**SPAN5233 Golden Age Novel (IR)** Major works of Spanish prose fiction from the 16th and 17th centuries, with close reading of major works.

**SPAN5243 Golden Age Poetry and Drama (IR)** History and development of those genres in the 16th and 17th centuries, with close reading of major works.

**SPAN5253 Colonial Literature and Culture (FA, SP, SU)** 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.

**SPAN5273 Nineteenth Century Survey (IR)** From Neoclassicism through Naturalism.

**SPAN5283 Nineteenth Century Drama and Poetry (IR)** From Romanticism to the Generation of 1898.

**SPAN5343 Advanced Survey of Spanish Literature Since 1898 (IR)** intensive survey of the literature of Spain from the Generation of 1898 to the present. Prerequisite: graduate standing.

**SPAN5363 Spanish American Literature (1492-1900) (IR)** Representative of works of Spanish American prose and poetry, including selections from indigenous literatures, the crónicas, and colonial literature up to the movement of modernism.

**SPAN5383 Twentieth Century Spanish American Poetry (IR)** From the development of modernism to the present day.

**SPAN5393 19th Century Spanish American Literature (FA, SP, SU)** 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.

**SPAN5403 Spanish American Theatre (FA, SP, SU)** Historical examination of the theatre in Spanish America, with close analysis particularly of representative works and movements in the 20th century.

**SPAN5433 Cervantes: Don Quijote (IR)** A close reading of Spain's greatest literary masterpiece.

**SPAN5453 Cinema and Literature (IR)** This course examines several Latin American and Spanish texts and their film adaptations as well as the main film making trends in the Hispanic world.

**SPAN5463 20th Century Spanish American Literature (FA, SP, SU)** 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.

**SPAN5533 Mexican Literature (FA, SP, SU)** An exploration of the special features and particular qualities of Mexican literature, as one of the most representative and complex of the Latin American national literatures. Includes an historical survey, but each class will focus on selected topics and issues especially in modern Mexican literature and culture.

**SPAN5603 History of the Spanish Language (IR)** Spanish from its origins to the present; relations between Spanish and the other romance languages.

**SPAN5703 Special Topics (IR)** May be offered in a subject not specifically covered by the courses otherwise listed. May be repeated for 6 hours.

**SPAN575V Special Investigations (1-6) (IR)** May be repeated.

**SPAN5803 Seminar (IR)** Seminar subjects vary from

year to year. Available subjects, given as needed, include the Old Spanish Language, the Celestina, 20th century Spanish drama, and the romances. May be repeated for 6 hours.

**SPAN600V Master's Thesis (1-6) (IR)**

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## (SPED) SPECIAL EDUCATION

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**SPED5103 Nature and Needs of the Moderately and Severely Retarded (FA, SP, SU)** Educational, psychological, and social characteristics of children with moderate and severe mental retardation. Prerequisite: CIED 3023.

**SPED560V Workshop (3-6) (FA, SP, SU)**

**SPED599V Seminar (1-18) (IR)**

**SPED600V Master's Thesis (1-3) (IR)**

**SPED605V Independent Study (1-18) (FA, SP, SU)**

**SPED699V Doctoral Seminar (1-3) (FA, SP, SU)**

**SPED700V Doctoral Dissertation (1-6) (FA, SP, SU)** Prerequisite: candidacy.

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## (STAT) STATISTICS

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**STAT2023 Biostatistics (SP)** An introductory course in biostatistics emphasizing methods for collecting, graphing, and understanding data. Special emphasis is placed upon available methods for both exploratory and confirmatory data analysis. Particular attention is given to statistical methods for data sets with discrete variables. Pre- or Corequisite: MATH 2554. Corequisite: STAT 2020L.

**STAT2020L Biostatistics Laboratory (SP)** Computer laboratory to accompany STAT 2023. Corequisite: STAT 2023.

**STAT2303 Principles of Statistics (SP)** A problem-oriented course with applications from many fields. Emphasis on understanding the nature of statistical orderliness implied by probability laws. Statistical analysis is treated as a means of decision making in the face of uncertainty.

**STAT3013 Introduction to Probability and Statistics (FA, SP, SU)** A calculus-based introduction to the foundations of probability and statistics. Emphasis is placed upon understanding elementary properties of probabilities, events, statistical densities and distributions, properties of random variables, law of large numbers, and their relationship to sampling and statistical inference. Prerequisite: MATH 2564.

**STAT4003 Statistical Methods (FA, SP)** Concepts of probability, sampling, regression, and experimental design. Corequisite: STAT 4001L. Prerequisite: MATH 2554.

**STAT4001L Statistics Methods Laboratory (FA, SP)** Emphasis on use of integrated statistical packages to complement statistical methodology being covered concurrently in STAT 4003. Corequisite: STAT 4003.

**STAT4033 Nonparametric Statistical Methods (FA, SP, SU)** Chi square tests. Kolmogorov-Smirnov goodness-of-fit tests, the Mann-Whitney and Wilcoxon 2-sampling tests, and various nonparametric measures of association. Prerequisite: MATH 1203 and junior standing.

**STAT4043 Sampling Techniques (FA, SP, SU)** Considers optimum techniques of simple random, stratified random, cluster, systematic and multistage sampling from finite populations subject to cost precision constraints. Wide range of application. Prerequisite: STAT 4003.

**STAT4373 Experimental Design (SP)** 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. Prerequisite: STAT 4003.

**STAT5103 Theory of Statistics (FA)** 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.

**STAT5113 Statistical Inference (SP)** Statistical theory of estimation and testing hypothesis. Prerequisite: STAT 5103.

**STAT5313 Regression Analysis I (SP)** Matrix formulation of least squares and multiple regression models. Estimability and use of the generalized inverse in analysis of variance and covariance models of less than full rank. Computational aspects are emphasized.

**STAT5322 Statistical Packages (FA, SP)** Emphasis on use of digital computer to perform statistical data analysis

through the use of integrated statistical packages. Instruction includes use of the SAS, SPSS, and BMD packages. Data management operations as well as formal statistical procedures such as ANOVA and regression are considered. Prerequisite: 3 hours of statistics.

**STAT5333 Analysis of Categorical Responses (SP)** A modern treatment, including extensions of classical probit analysis, multivariate logistic models, GSK model, loglinear models in analysis of multiway contingency tables, and nonmetric multidimensional scaling. Prerequisite: STAT 5313.

**STAT5343 Stochastic Processes (FA, SP, SU)** Markov chains, branching processes, birth-death processes, queueing theory with application. Prerequisite: STAT 5103.

**STAT5353 Methods of Multivariate Analysis II (SP)** Hotelling's T<sup>2</sup> procedures, multivariate analysis of variance, discriminant function analysis and problems of classification, multidimensional scaling, and cluster analysis. Prerequisite: STAT 5313.

**STAT5383 Time Series Analysis (FA, SP, SU)** Identification, estimation and forecasting of time series. Spectral analysis including the fast Fourier transform computational aspects are emphasized. Prerequisite: STAT 5103.

**STAT5413 Spatial Statistics (FA)** 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.

**STAT610V Research in Statistics (1-4) (IR)** Prerequisite: graduate standing.

**STAT639V Topics in Statistics (1-3) (IR)** Current state of the art on methodology in one of the topics: multivariate analysis, time series analysis, sequential analysis, factor analysis, or biostatistics. May be repeated.

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## (TLOG) TRANSPORTATION AND LOGISTICS

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**TLOG3443 Principles of Transportation (FA, SP, SU)** Examines forms of transportation and institutional factors that influence transportation decisions; regulation, public policy, other governmental variables reviewed in detail. An introduction to physical distribution's interaction with transportation explored. Prerequisite: ECON 2013 and ECON 2023 or ECON 2143.

**TLOG3613 Business Logistics (FA, SP, SU)** Management of logistics functions in the firm including physical supply and distribution activities such as transportation, storage facility location, inventory control, materials handling, warehousing, and organization. Prerequisite: (ECON 2013 and ECON 2023) or ECON 2143.

**TLOG3623 Purchasing and Inventory Systems (FA)** Management of the purchasing function, including organization, procedures, supplier selection and development, quality control, price determination, global sourcing, and methods of inventory control. Prerequisite: TLOG 3613.

**TLOG410V Special Topics in Logistics (1-3) (IR)** 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. May be repeated for 6 hours. Prerequisite: TLOG 3613.

**TLOG4633 Transportation Carrier Management (FA)** Reviews special management techniques and analytical framework available for solving problems associated with transportation companies. Prerequisite: TLOG 3443.

**TLOG4643 International Transportation and Logistics (SP)** Logistics activities in international business with special emphasis on transportation, global sourcing, customs issues, governmental influence, facility location in global environment, and import-export opportunities. Special emphasis is placed on current events and their effect on the marketing and logistics activities of U.S.-based organizations. Pre- or Corequisite: TLOG 3443. Prerequisite: TLOG 3613.

**TLOG4653 Transportation and Logistics Strategy (SP)** Design and management of transportation and logistics systems for firms of varying size and different supply and market conditions. This capstone course relies heavily on computer assisted cases and lectures from visiting transportation and logistics executives. Prerequisite: TLOG 3443 and TLOG 3613.

**TLOG466V Independent Study in Transportation and Logistics (1-3) (FA, SP, SU)** Permits students to explore selected topics in transportation/logistics.

**TLOG560V Special Topics in Logistics (1-3) (IR)**  
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.

**TLOG5633 Business Logistics Systems (FA)** Case approach to physical distribution problems of wholesale, retail, manufacturing establishments.

**TLOG5643 Strategic Issues in Transportation Management (FA)** 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.

**TLOG5653 Global Logistics Strategy (SP)**  
Transportation and logistics activities of multinational firms with emphasis on transportation, customer service, inventory control, facility location, global sourcing, customs documentation, and the role of government in importing and exporting. Attention given to current events and their effect on the marketing and logistics activities of U.S.-based organizations. Prerequisite: TLOG 5633.

**TLOG5663 Supply Chain Management (FA)** 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.

**TLOG5673 Transportation & Logistics Modeling (SP)** This course examines technology and computer applications in transportation and logistics, using an integrated supply chain management technique. Topics covered include computer information systems, decision support systems, optimization models, simulation, advanced statistics, and commercial logistics software systems. Prerequisite: TLOG 5633 and TLOG 5643.

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## (VAED) VOCATIONAL

### EDUCATION/ADULT EDUCATION

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**VAED1003 Self-Directed Learning Seminar (FA, SP)** This course is designed to take students beyond orientation into the realm of taking responsibility for their academic decisions and learning. The focus is on the whole student and the whole college experience.

**VAED3113 Skills/Strategies in Human Resource Development (FA, SP, SU)** Addresses the acquisition of professional skills and strategies associated with creating and maintaining adult learning environments. Involves a regular class workshop situation where skills are practiced and encouraged and a work-based situation where skills are tried and implemented as well as assessed.

**VAED3123 Theory and Principles of Needs Assessment and Evaluation in Human Resource Development (FA)** Addresses the acquisition of and application of knowledge associated with needs assessment and evaluation of human resources with emphasis on workplace situations.

**VAED3133 Communication in Human Resource Development (FA, SP, SU)** This course provides an introduction to communication principles and practices in the HRD area. The emphasis is on identifying/developing HRD communication skills that apply to roles, responsibilities and strategies; and exploring how organizations/individuals communicate and their impact on HRD. Both theoretical and practical applications will be included.

**VAED3213 Introduction to Human Resource Development (FA, SP, SU)** Addresses the theory and processes of needs analysis, teaching/learning strategy design and implementation associated with creating and maintaining adult learning environments. Emphasis on the design and implementation of strategies and the evaluation of the educational outcomes. The professional practice section addresses the way in which adult learning environments can be used to implement experimental strategies discussed in tutorial sessions without putting participants at risk.

**VAED4113 Theory and Principles of Adult Education (FA, SP, SU)** Focus of study on the concept of individual differences, what they are, and how they affect the learning and teaching of adults.

**VAED4133 Applied Theory/Principle of Group Dynamics (FA, SP, SU)** This course is designed for persons who are practicing facilitators of adult learning in a workplace setting. The course focuses on the various theories and principles that explain the underlying reasons for group

behaviors and processes in the workplace.

**VAED4213 Strategies in Professional Development (FA, SP, SU)** Students are encouraged to examine their own learning processes and professional development in terms of the theories and principles of how adults learn. Methods and strategies for self development and change are discussed. Self-directed lifelong learning strategies that ensure continued growth for professional adult educators/human resource development practitioners will be discussed.

**VAED4233 Leadership in Human Resource Development (HRD) (FA, SP, SU)** This course provides an introduction to leadership principles and practices in the HRD area, and is intended as a foundation course for students practicing, or who plan to pursue a career in HRD. The emphasis is on identifying/developing HRD leadership skills and exploring various functions/attributes of leadership and their impact on HRD. Both theoretical and practical applications will be included.

**VAED450V Experiential Learning (1-20) (FA, SP, SU)** This course is limited to persons qualifying for experiential credit to be applied to Industrial/Technology Plan II, Technical Performance Improvement, Option III, Human Resource Development. May be repeated for 33 hours.

**VAED605V Independent Study (1-18) (IR)**

**VAED6113 Administrative Leadership for Vocational and Adult Education (FA, SP, SU)** The function of administering vocational and adult education programming is addressed through the study of leadership style, function, and constituency.

**VAED6123 Supervision in Vocational and Adult Education (SU)** Principles and procedures of effective supervision; supervisory techniques and practices in facilitating and improving instructional programs and vocational and adult education.

**VAED6133 Instructional Management in Vocational and Adult Education (FA, SP, SU)** An analysis of designing and managing vocational and adult instructional programs with competency developing in directing curriculum development, improving instruction, formulating schedules, and installing competency-based education.

**VAED6143 Student Services in Vocational and Adult Education (FA, SP, SU)** A comprehensive course that includes managing student recruitment and admissions, providing systematic counseling and guidance services, maintaining overall school discipline, establishing a student placement service, and coordinating follow-up studies.

**VAED6203 Instructional Materials in Vocational and Adult Education (FA, SP, SU)** A comprehensive course designed to give students the opportunity to understand, prepare, and test materials leading toward excellence in instruction.

**VAED6213 Curriculum Development in Vocational and Adult Education (FA, SP, SU)** Determining principles of curriculum development, organizing curricula, and evaluating curriculum materials with special reference to vocational and adult education.

**VAED6223 Advanced Methods in Vocational and Adult Education (FA, SP, SU)** Improvement of instruction in vocational and adult education; particular emphasis upon formulating goals and objectives, structuring course of study, group and self-instructional methods, and evaluation of instruction.

**VAED6303 Program Planning and Evaluation in Vocational and Adult Education (FA, SP, SU)** Emphasis is given to understanding the theoretical foundation upon which the programming process is predicated, developing a theoretical mode, and acquiring the conceptual tools necessary for analyzing the programming process in any vocational or adult education organization.

**VAED6403 Special Topics in Human Resource Development (FA, SP, SU)** Designed for persons interested in exploring topics specific to vocational and adult education and human resource development in business and industry settings. Emphasis given to examining vocational and adult education research as applied in the public and private sector.

**VAED6413 Developing Human Resources (FA, SP, SU)** Practical and innovative strategies for making the optimum use of all employees in both private and public organizations.

**VAED6423 Foundations of Human Resource Development (FA, SP, SU)** An overview of human resource development (HRD) in organizations. Focus on the integration of individual development (training), career development, and organizational development. Topics include

strategic planning for human resource development, needs assessment, program development, application of workplace learning theories, career development theories and methods, and application of organizational learning theories.

**VAED6433 Facilitating Learning in the Workplace (FA, SP, SU)** Facilitation of learning and performance improvement in the workplace. Application of instructional methods, informal and incidental 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.

**VAED6443 Program Evaluation in Human Resource Development (SP, Even years)** This course is a doctoral level course designed as an introduction to program evaluation in human resource development, training, and other HRD interventions. Emphasis is on (a) systems thinking applied to evaluation, (b) organizational development and program improvement, and (c) the integration of evaluation with strategic planning and performance improvement.

**VAED6453 Training in the Workplace (FA, SP, SU)** An introduction to and survey of current theories and practices in training in the workplace. Students are expected to explore selected interdisciplinary topics in areas such as adult education, vocational education, human resource development, organizational behavior, instructional technology, and economics as they relate to training in the workplace.

**VAED6463 Training Needs Assessment (FA, SP, SU)** Emphasis on analyzing, designing, developing, implementing, and evaluating training for business and industry.

**VAED6503 Computer Technology in Vocational and Adult Education (FA, SP, SU)** A study of computer technology as it relates to vocational and adult education. Brief introduction to computers, overview of hardware and software, hands-on learning of word processor, spreadsheet, data base, desktop publishing, telecommunication, graphics, CAD/CAM, and/or CAI/CMI packages are covered.

**VAED660V Workshop (1-18) (FA, SP, SU)** May be repeated for 6 hours. Prerequisite: advanced graduate standing.

**VAED674V Internship (1-18) (IR)** Prerequisite: advanced graduate standing.

**VAED680V Educational Specialist Project (1-6) (IR)** An original project, research paper, or report required of all Ed.S. degree candidates. Prerequisite: admission into E.D.S. program.

**VAED692V Directed Field Experience (1-18) (IR)** Teaching and supervision in secondary or post-secondary schools or work in business or industry under guidance. For students who desire or need directed experience.

**VAED699V Seminar (1-18) (IR)**

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## (VOED) VOCATIONAL EDUCATION

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**VOED200V Work Experience I (1-6) (FA, SP, SU)**  
Method of securing a position and making a beginning, communication skills, job skills, and related information for the specific vocation.

**VOED201V Work Experience II (1-6) (FA, SP, SU)**  
Job rating skills for work experience, mathematics for specific vocations, job skills, and related information for intermediate jobs in a specific vocation.

**VOED202V Work Experience III (1-6) (FA, SP, SU)**  
Personality factors, safety judgments, vocabulary for the occupation, job skills, and related information for advanced jobs in a specific vocation.

**VOED203V Work Experience IV (1-6) (FA, SP, SU)**  
Advanced mathematical skills, communication skills for a specific vocation, evaluation in business and industry, job skills, and related information at the journeyman level.

**VOED204V Work Experience V (1-6) (FA, SP, SU)**  
Human relations, economics of business and industry, public relations, job skills, and related information at the supervisory level.

**VOED3001 Orientation to VOED (FA, SP, SU)**  
Study of the status of vocational education in public and private schools of our nation with an emphasis on Arkansas schools. Major emphasis is placed on vocational education in secondary schools and 1- and 2-year undergraduate-level students with a major in vocational education.



**VOED3112 Vocational Student Organizations (FA)**  
Survey of student organizations from all vocational service areas including purposes of the organizations, methods of integrating the organization into classroom activities, and being an effective adviser.

**VOED380V Supervised Work Experience (1-9)**  
(FA, SP, SU) Supervision in business and industry under guidance. Designed for students who desire or need directed occupational experience. May be repeated for 6 hours.

**VOED390V Performance Based Teacher Education (3-12)** (FA, SP, SU) Development of competencies related to the methodology of instructional planning, execution, and evaluation. Provided by PBTE modules and University resource person. Enrollment before VOED 391V and 392V. Prerequisite: employed in service vocational-technical education field based instructor.

**VOED391V Performance Based Teacher Education (3-12)** (FA, SP, SU) Development of competencies related to vocational guidance, contemporary instructional techniques, and student vocational organizations. Provided by PBTE modules and University resource person. May be repeated for 24 hours. Prerequisite: completion of 12 credit hours of VOED 390 and employee inservice-vocational-technical education field based instructor.

**VOED392V Performance Based Teacher Education (3-12)** (FA, SP, SU) Development of competencies related to program planning, development, evaluation; school-community relations; and professional development. Provided by PBTE modules and University resource person. Prerequisite: completion of 12 credit hours of VOED 391 and employee inservice-vocational-technical education field based instructor.

**VOED393V Performance Based Internship (3-6)**  
(FA, SP, SU) In an actual school setting the student will satisfactorily demonstrate the competencies required to conduct a total vocational-technical education program. Instruction and follow-up will be provided by a University resource person. May be repeated for 24 hours. Prerequisite: completion of 12 credit hours of VOED 392 and employee inservice-vocational-technical education field based instructor.

**VOED4002 Introduction to Professionalism** (FA, SP, SU) Studying and developing professional concepts in vocational education with accepted principles of professionalism applied to vocational education settings.

**VOED4013 Presentation Techniques** (FA) Methods and techniques in the preparation and delivery of teaching.

**VOED4122 Leadership Development** (FA, SP, SU) Studying and developing leadership in vocational education using commonly accepted principles of leadership applied to vocational education settings.

**VOED4303 Business Communications in Education** (FA, SP, SU) Emphasizes applying and understanding principles of written and oral communication in the business/education field. Specific attention given to communication and organizations, using words effectively, communicating through letters and memoranda, communicating through reports, oral communication, and communicating today and tomorrow.

**VOED4403 Nutrition Education and Counseling** (IR) Nutrition education and counseling methods for dietitians and other health professionals. Prerequisite: HES 1213 and junior standing.

**VOED480V Problems in Vocational Education (1-6)** (FA, SP, SU) Problems and issues relating to instruction in vocational and technical education. May be repeated for 24 hours.

**VOED481V Problems in Technical Education (1-3)** (FA, SP, SU) A consideration of special problems relating to technical education.

**VOED5004 Cohort Directed Field Experience** (FA, SP, SU) A minimum of 8 weeks will be spent in an off-campus school, at which time the student will have an opportunity to observe 6 classroom teachers and to teach under supervision. Prerequisite: cohort year status.

**VOED5016 Cohort Teaching Internship** (FA, SP, SU) A minimum of 10 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: cohort year status.

**VOED5103 Teaching Strategies in Vocational Education** Methods and techniques in teaching vocational business, home economics, and industrial technology education.

**VOED5113 Laboratory Management in Vocational Education** Selection, design, and evaluation of laboratory

experiences in vocational business, home economics, and industrial technology education.

**VOED5123 Current Design and Evaluation in Vocational Education** (FA, SP, SU) Methods and techniques in developing, organizing, implementing, and evaluating programs in vocational education.

**VOED5191 Applied Research** (FA, SP, SU) Interpretation and evaluation of research in education for classroom utilization.

**VOED5203 School-To-Workforce** (FA, SP, SU) This course is designed to provide information on the role of the school in workforce development and to introduce a teacher to the skills desired in a seamless educational curriculum model.

**VOED5253 Career Orientation Programs** (FA, SP, SU) Provides a survey of types and sources of occupational information and methods of providing occupational-oriented experiences. Designed for teachers and future teachers of career orientation and is 1 of 2 required courses for vocational career orientation.

**VOED5263 Applications in Career Orientation** (FA, SP, SU) Student is introduced to various teaching methods and techniques of managing hands-on activities in career orientation class setting.

**VOED574V Internship (1-18)** (IR)

**VOED5803 Contemporary Issues in Vocational Education** (FA, SP, SU) A study of issues, problems, and challenges pertaining to the goals, objectives, organization, and curriculum of the vocational education program.

**VOED5823 Foundations of Vocational Education** (FA, SP, SU) Surveying and interpreting the origin, principles, and objectives of vocational education and its relationship to other educational programs. Required for all graduate degree candidates in vocational education.

**VOED599V Seminar (1-18)** (IR)

**VOED600V Master's Thesis (1-18)** (IR)

**VOED700V Doctoral Dissertation (1-18)** (FA, SP, SU) Prerequisite: candidacy.

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## (WCIV) WESTERN CIVILIZATION

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**WCIV1003 Institutions and Ideas of Western Civilization** (FA, SP, SU) Examination of major themes of Western history from the Ancient Near East through the Reformation and an evaluation of their contribution to contemporary life and culture.

**WCIV1013 Institutions and Ideas of Western Civilization II** (FA, SP, SU) Examination of major themes of Western history since the Reformation and an evaluation of their contribution to contemporary life and culture.

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## (WCOB) WALTON COLLEGE OF BUSINESS

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**WCOB1012 Legal Environment of Business** (FA, SP, SU) Introduction to the legal and ethical environment in which businesses operate. Topics covered in this survey course include: foundations of the American legal system, regulatory environment, torts, criminal law, laws affecting contracts and property, employment law, and forms of doing business.

**WCOB1012H Honors Legal Environment of Business** (FA, SP, SU) Introduction to the legal and ethical environment in which businesses operate. Topics covered in this survey course include: foundations of the American legal system, regulatory environment, torts, criminal law, laws affecting contracts and property, employment law, and forms of doing business.

**WCOB1023 Business Foundations** (FA, SP, SU) Presents an integrated view of business organizations by studying the business processes that are common to most businesses, including the acquisition of capital and human resources, purchasing, production, and sales. This course also develops the accounting model that captures information about business processes and reports results through formal financial statements. Prerequisite: COMM 1313 with grade of "C" or better; and WCOB 1120.

**WCOB1023H Honors Business Foundations** (FA, SP, SU) Presents an integrated view of business organizations by studying the business processes that are common to most businesses, including the acquisition of

capital and human resources, purchasing, production, and sales. This course also develops the accounting model that captures information about business processes and reports results through formal financial statements. Prerequisite: COMM 1313 with grade of "C" or better; and WCOB 1120.

**WCOB1033 Data Analysis and Interpretation** (FA, SP, SU) This is an introductory level course covering topics involving estimation of population characteristics, research design and hypothesis testing, as well as measuring and predicting relationships. The course should enable the students to develop an understanding regarding the application and interpretation of basic data analysis techniques with an emphasis on statistical applications. Prerequisite: MATH 2053 with grade of "C" or better.

**WCOB1111 Freshman Business Connection** (FA) (First offered Summer 2002, Formerly BADM 1111) Development of personal development skills, including time management; stress management and academic planning, necessary for success; introduction to business career options and opportunities.

**WCOB1111H Honors Freshman Business Connection** (FA) Development of personal development skills, including time management; stress management and academic planning, necessary for success; introduction to business career options and opportunities.

**WCOB1120 Computer Competency Requirement** (FA, SP, SU) Students entering the Walton College are expected to possess basic competencies in MS Windows, Word, Excel, PowerPoint, Access, and Blackboard, and be familiar with e-mail and the Internet. Students need to pass a competency test. Deficiencies may be remedied through appropriate self-paced, computer-based instruction.

**WCOB2013 Markets and Consumers** (FA, SP, SU) Key decisions required to understand the existence of markets and how buyers within those markets may be accessed profitably. Key concepts include an overview of competitive markets, buyer behavior, developing new markets and products, promotion and distribution channels, pricing and profitability concepts, the sales and collections process, and strategic planning. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of "C" or better.

**WCOB2013H Honors Markets and Consumers** (FA, SP, SU) Key decisions required to understand the existence of markets and how buyers within those markets may be accessed profitably. Key concepts include an overview of competitive markets, buyer behavior, developing new markets and products, promotion and distribution channels, pricing and profitability concepts, the sales and collections process, and strategic planning. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of "C" or better.

**WCOB2023 Production and Delivery of Goods and Services** (FA, SP, SU) This course is designed to provide students with a broad understanding of the production and delivery of goods/services. The course focuses on concepts and methodologies for managing the flow of material and information throughout the production and delivery of goods/services. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of "C" or better.

**WCOB2023H Honors Production and Delivery of Goods and Services** (FA, SP, SU) This course is designed to provide students with a broad understanding of the production and delivery of goods/services. The course focuses on concepts and methodologies for managing the flow of material and information throughout the production and delivery of goods/services. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of "C" or better.

**WCOB2033 Acquiring and Managing Human Resources** (FA, SP, SU) Study of the process of acquiring and managing human resources, focusing on the organizational behavior, legal, economic, and technical issues concerned with business decisions about acquiring, motivating, and retaining employees; emphasis given to the development, implementation, and assessment of policies and practices consistent with legal, social, human, and environmental dynamics. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of "C" or better.

**WCOB2033H Honors Acquiring and Managing Human Resources** (FA, SP, SU) Study of the process of acquiring and managing human resources, focusing on the organizational behavior, legal, economic, and technical issues concerned with business decisions about acquiring, motivating, and retaining employees; emphasis given to the development, implementation, and assessment of policies and practices consistent with legal, social, human, and environmental dynamics. Prerequisite: WCOB 1023, WCOB



1033, ECON 2023, and WCOB 1012—each with a grade of “C” or better.

**WCOB2043 Acquiring and Managing Financial Resources (FA, SP, SU)** Key decisions within business processes related to the acquisition and management of capital resources, including decisions regarding what to acquire, how to finance the acquisition, and issues related to the accounting for those capital resources. The identification of key decisions leads to decision models and the identification of information needs. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of “C” or better.

**WCOB2043H Honors Acquiring and Managing Financial Resources (FA, SP, SU)** Key decisions within business processes related to the acquisition and management of capital resources, including decisions regarding what to acquire, how to finance the acquisition, and issues related to the accounting for those capital resources. The identification of key decisions leads to decision models and the identification of information needs. Prerequisite: WCOB 1023, WCOB 1033, ECON 2023, and WCOB 1012—each with a grade of “C” or better.

**WCOB3003H College Honors Colloquium (FA, SP)** (First Offered Summer 2002, Formerly BADM 3003H) An inter-disciplinary course exploring events, concepts, and/or new developments in the field of business administration. May be repeated for 6 hours. Prerequisite: Junior or senior standing.

**WCOB300V Study Abroad (1-15) (FA, SP, SU)** (First Offered Summer 2002, Formerly BADM 300) Open to undergraduate students studying abroad in officially sanctioned programs. May be repeated for 24 hours.

**WCOB3016 Business Strategy and Planning (FA, SP)** Integrative study of the managerial decisions; introduces students to an understanding of strategic competitiveness and the way in which business strategy is formulated and implemented; uses a combination of theoretical and experiential approaches to designing business plans for key decisions, implementing these decisions, and monitoring their effects. Prerequisite: a business student must complete the pre-business requirements before enrolling for this course. WCOB 2013, WCOB 2023, WCOB 2033, and WCOB 2043 must each be completed with a grade of “C” or better. This course is restricted to Walton College students.

**WCOB3016H Honors Business Strategy and Planning (FA, SP)** Integrative study of the managerial decisions; introduces students to an understanding of strategic competitiveness and the way in which business strategy is formulated and implemented; uses a combination of theoretical and experiential approaches to designing business plans for key decisions, implementing these decisions, and monitoring their effects. Prerequisite: a business student must complete the pre-business requirements before enrolling for this course. WCOB 2013, WCOB 2023, WCOB 2033, and WCOB 2043 must each be completed with a grade of “C” or better. This course is restricted to Walton College students.

**WCOB310V Cooperative Education (1-3) (FA, SP, SU)** (First Offered Summer 2002, Formerly BADM 310) Co-op allows students to earn one or two hours of credit per semester for work related to their major. Accumulated credit may not exceed six hours. Eligibility requires: 1) junior standing in the college, 2) completion of the pre-business core and 3) the prescribed GPA. See catalog for details. May be repeated for 6 hours. Prerequisite: junior standing and completion of pre-business core.

**WCOB410V Special Topics in Business (1-3) (IR)** Special business topics of an interdisciplinary nature. May be repeated for 6 hours.

**WCOB455V Service Learning Practicum (1-2) (FA, SP, SU)** (First Offered Summer 2002, Formerly BADM 455) Through participation in this practicum, students learn while providing services that benefit the community. The goal is for students to learn, practice, and teach the principles of free enterprise. The students assess community needs and design service projects that enable them to apply course content knowledge while developing organizational, communication, time-management, and leadership skills. May be repeated for 6 hours.

**WCOB499VH Honors Thesis (2-3) (SP)** (First Offered Summer 2002, Formerly BADM 499H) Provides Honors Students with an opportunity to explore a business topic in depth through an independent research project. Prerequisite: good standing in the Walton College Honors Program.

**WCOB500V Study Abroad (1-12) (FA, SP, SU)** (First Offered Summer 2002, Formerly BADM 500) Open to graduate students studying abroad in officially sanctioned programs. May be repeated for 12 hours.

**WCOB510V Special Topics in Business (1-3) (IR)** Special business topics of an interdisciplinary nature. May be repeated for 6 hours.

**WCOB611 Seminar in Business Administration Teaching I (FA)** (First Offered Summer 2002, Formerly BADM 611) 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.

**WCOB612 Seminar in Business Administration Teaching II (FA, SP)** (First Offered Summer 2002, Formerly BADM 612) Given that the student has successfully completed Seminar in Business Administration Teaching I, this course is suggested as the second course in the sequence. It is designated a ‘hands on’ teaching course. Students will be assigned a class to teach by their respective department and will be supervised. In addition, all students in the class will come together for seminar discussion twice per month. Prerequisite: WCOB 611 or equivalent.

**WCOB613 Seminar in Business Administration Teaching III (FA, SP)** (First Offered Summer 2002, Formerly BADM 613) This is an advanced course in college level teaching 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 enhance graduate students’ knowledge of teaching pedagogy given a base knowledge and classroom experience. This course will focus on current and advanced topics of teaching and learning, as well as research in teaching. Prerequisite: WCOB 611 or equivalent, WCOB 612 suggested.

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## (WLIT) WORLD LITERATURE

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**WLIT1113 World Literature I (FA, SP, SU)** An introduction to literature from the beginning of civilization to about 1650.

**WLIT1113C World Literature I (IR)** An introduction to literature from the beginning of civilization to about 1650. Corequisite: WLIT 1110D.

**WLIT1113H Honors World Literature I (FA, SP, SU)** Introduction to the study of both western and non-western literature. Prerequisite: Participation in Fulbright College Scholars Program or English ACT score of 28 or above.

**WLIT1110D World Literature I Drill (IR)** Corequisite: WLIT 1113C.

**WLIT1123 World Literature II (FA, SP, SU)** An introduction to literature from 1650 to the present. Prerequisite: WLIT 1113.

**WLIT1123H Honors World Literature II (FA, SP, SU)** A continuation of the study of literary masterpieces of the world. Prerequisite: WLIT 1113H and participation in the Fulbright College Scholars Program or English ACT score of 28 or above.

**WLIT2323 Greek and Roman Mythology (IR)** A study of the stories, figures, and motifs in the mythology of Greece and Rome. Prerequisite: ENGL 1013 and ENGL 1023.

**WLIT2333 Patterns in Mythology (IR)** An analytic study of the recurrent patterns, themes and motifs in the mythology. May include Norse, Celtic, Babylonian, Indian, American Indian materials. Greek and Roman material will generally be excluded from the course. Prerequisite: WLIT 1113.

**WLIT3253 Literary Criticism (IR)** The history of literary theories and methods from Plato to the present.

**WLIT3263 The European Novel to 1900 (IR)** Novels representative of several schools and countries to 1900.

**WLIT3273 European Short Story (IR)** The short story as practiced by the European masters of the 19th and 20th centuries; short stories (in translation) representative of a number of countries and a wide variety of types.

**WLIT3623 The Bible as Literature (IR)** The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms.

**WLIT3963 Twentieth-Century Continental Novel (IR)** Survey of the continental novel from 1900 to the present.

**WLIT3983 Special Studies (IR)** Covers a topic not usually presented in depth in regular courses. Not an independent study. This course may be repeated. May be repeated for 6 hours. Prerequisite: junior standing.

**WLIT4123 Survey of Russian Literature from Its Beginning to the 1917 Revolution (IR)** 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.

**WLIT4133 Survey of Russian Literature Since the 1917 Revolution (IR)** 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.

**WLIT4213 Literature and Eros (IR)** Survey of important works from the classical Greeks to contemporary literature that deals with the erotic experience. Study of various theories and cultural definitions of eroticism, especially as distinct from clinical sexuality and romantic sentimentality.

**WLIT4273 Literature of India and the Near East (IR)** Leading works and genres of the ancient civilizations, the Moslem world and India, and their contribution to the Western literary tradition.

**WLIT4293 Literature of China and Japan (IR)** Survey of the literary works of the Far East, and of its contribution to the Western Tradition.

**WLIT4913 Literary Reflections of the Holocaust (IR)** Drawing on fiction, poetry, autobiography, and drama from works written originally in French, Polish, German, Dutch, English, and Yiddish, this course introduces students to the Holocaust through literature. Deals with the adequacy of imaginative literature in the face of atrocity, the comparative effectiveness of fiction versus autobiography, and the dangers of exploitation and trivialization.

**WLIT4923 Modern World Drama (IR)** Drama from Ibsen to the 1930s.

**WLIT4963 Contemporary World Drama (IR)** Drama since the 1930s.

**WLIT4993 African Literature (IR)** 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.

**WLIT5193 Introduction to Comparative Literature (IR)** Literary theory, genres, movements, and influences. Prerequisite: WLIT 1113.

**WLIT5233 Form and Theory of Translation (IR)** 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.

**WLIT5483 Germanic and Celtic Backgrounds of Medieval Literature (IR)** Literary traditions of Old and Middle English, of Germany, Ireland, Scandinavia, and Wales.

**WLIT5593 The Renaissance (IR)** Italian forms and writers of the late 15th and 16th centuries and the spread of the Renaissance tradition in Spain, Portugal, France, and Northern Europe up to 1660.

**WLIT5623 The Bible as Literature (IR)** The several translations of the Bible; its qualities as great literature; its influence upon literature in English; types of literary forms.

**WLIT5793 The Enlightenment (IR)** Literature of the late 17th and 18th centuries, especially in France and Germany.

**WLIT5963 Twentieth-Century Continental Novel (IR)** Survey of the continental novel from 1900 to the present.

**WLIT600V Master’s Thesis (1-6) (FA, SP, SU)**

**WLIT603V Special Studies in Comparative Literature (1-6) (IR)**

**WLIT690V Seminar (1-6) (IR)**

**WLIT699V Master of Fine Arts in Translation Thesis (1-6) (FA, SP, SU)**

**WLIT700V Doctoral Dissertation (1-12) (FA, SP, SU)**

**(ZOOL) ZOOLOGY**

**ZOOL1613 Principles of Zoology** (FA, SP, SU) Introduction to zoological principles relating to cells, organ systems, development, genetics, ecology, and animal phyla. Corequisite: ZOOL 1611L. Prerequisite: BIOL 1543 and BIOL 1541L.

**ZOOL1611L General Zoology Laboratory** (FA, SP, SU) Laboratory exercises illustrating animal structure, physiology, genetics, and ecology. Corequisite: ZOOL 1613.

**ZOOL1611M Honors General Zoology Laboratory** (FA, SP, SU) Laboratory exercises illustrating animal structure, physiology, genetics, and ecology. Corequisite: ZOOL 1613.

**ZOOL2213 Human Physiology** (FA, SP, SU) Fundamental concepts of physiology with emphasis in the human. Corequisite: ZOOL 2211L. Prerequisite: (CHEM 1023 and CHEM 1021L) or (CHEM 1074 and CHEM 1071L) or (CHEM 103 and CHEM 1101L) or (CHEM 1123 and CHEM 1121L) or equivalent and MATH 1203 or equivalent.

**ZOOL2211L Human Physiology Laboratory** (FA, SP, SU) Exercises include experiments on osmosis, reflexes, senses, muscle, cardiovascular system, ventilation, metabolism, renal function, etc. Data collection, analysis, and report writing. Does not satisfy the Fulbright College writing requirement. Corequisite: ZOOL 2213.

**ZOOL2404 Comparative Vertebrate Morphology** (FA, SP) Anatomy of selected vertebrate animals with emphasis upon homologous structures in various animal groups. Lecture 2 or 3 hours, laboratory 4 or 6 hours per week. ZOOL 2443 and ZOOL 2441L may not be counted for major in Zoology credit if prior credit in ZOOL 2404 has been earned. Corequisite: ZOOL 2400L. Prerequisite: BIOL 1543 and BIOL 1541L or equivalent.

**ZOOL2400L Comparative Vertebrate Morphology Laboratory** (FA, SP) Corequisite: ZOOL 2404.

**ZOOL2443 Human Anatomy** (FA, SP, SU) Description of human body as a series of organ systems and their interrelationships. Corequisite: ZOOL 2441L. Prerequisite: 4 hours of biological sciences.

**ZOOL2441L Human Anatomy Laboratory** (FA, SP, SU) Laboratory 3 hours exercises in mammalian anatomy. Cannot be taken without prior credit in ZOOL 2443 or concurrent enrollment in ZOOL 2443. Corequisite: ZOOL 2443.

**ZOOL2814 Invertebrate Zoology** (FA) Invertebrate phyla of animals with emphasis on structure, classification, and relationships. Lecture 3 hours, laboratory 3 hours per week. Corequisite: ZOOL 2810L. Prerequisite: BIOL 1543 and BIOL 1541L or equivalent.

**ZOOL2810L Invertebrate Zoology Laboratory** (FA) Corequisite: ZOOL 2814.

**ZOOL3353 Mechanics of Human Movement** (FA, SP, SU) An introduction to basic analysis of motor skills. No credit given towards major in Zoology. Prerequisite: ZOOL 2443 and ZOOL 2441L.

**ZOOL4544 Vertebrate Embryology** (FA) Development of selected vertebrates. Lecture 2 hours, laboratory 6 hours per week. Corequisite: ZOOL 4540L. Prerequisite: ZOOL 1543 and BIOL 1541L or equivalent and junior standing.

**ZOOL4540L Vertebrate Embryology Laboratory** (SP) Corequisite: ZOOL 4544.

**ZOOL4554 Developmental Biology** (SP) An analysis of the concepts of mechanisms of development emphasizing the experimental approach. Lecture 3 hours, laboratory 3 hours per week. Corequisite: ZOOL 4550L. Prerequisite: junior standing.

**ZOOL4550L Developmental Biology Laboratory** (SP) Corequisite: ZOOL 4554.

**ZOOL4623 Advanced Invertebrate Zoology** (SP, Odd years) Detailed consideration of selected freshwater and marine invertebrate taxa with emphasis on functional morphology, embryology, natural history and systematics. Lectures, laboratories, and field trips. Corequisite: ZOOL4620L.

**ZOOL4620L Advanced Invertebrate Zoology Laboratory** (SP, Odd years) Corequisite: ZOOL 4623.

**ZOOL4712 Aquaculture** (SP, Even years) General survey of principles and techniques of aquaculture. Lecture 2 hours per week. Prerequisite: 8 hours biological science.

**ZOOL4723 Fish Biology** (SP, Odd years) Morphology, classification, life history, population dynamics, and natural history of fishes and fish-like vertebrates. Lecture 2 hours, laboratory 3 hours per week. Corequisite: ZOOL 4720L. Prerequisite: 12 hours of biological science.

**ZOOL4720L Fish Biology Laboratory** (SP, Odd years) Corequisite: ZOOL 4723.

**ZOOL4733 Ichthyology** (FA, Even years) Taxonomy, systematics, and museum and collecting methods of fresh-water fishes, concentrating on the fishes of North America. Lecture 2 hours, laboratory 1 hour per week. Corequisite: ZOOL4730L. Prerequisite: ZOOL 2404 or equivalent.

**ZOOL4730L Ichthyology Laboratory** (FA, Even years) Corequisite: ZOOL 4733.

**ZOOL4763 Ornithology** (SP, Even years) Taxonomy, morphology, physiology, behavior, and ecology of birds. Lecture, laboratory, and field work. Corequisite: ZOOL 4760L. Prerequisite: 10 hours of biological sciences.

**ZOOL4760L Ornithology Laboratory** (SP, Even years) Corequisite: ZOOL 4763.

**ZOOL480V Special Problems (1-6)** (FA, SP, SU) May be repeated for 6 hours.

**ZOOL4814 Limnology** (FA, Odd years) Physical, chemical and biological conditions of inland waters. Lecture 3 hours, laboratory by arrangement. Corequisite: ZOOL 4810L. Prerequisite: (CHEM 1123 and CHEM 1121L) or equivalent and 12 hours of biological sciences.

**ZOOL4810L Limnology Laboratory** (FA, Odd years) Corequisite: ZOOL 4814.

**ZOOL4833 Animal Behavior** (FA, Odd years) Organization, regulation, and phylogeny of animal behavior, emphasizing vertebrates. Lecture, laboratory, and field work. Corequisite: ZOOL 4830L.

**ZOOL4830L Animal Behavior Laboratory** (FA, Odd years) Corequisite: ZOOL 4833.

**ZOOL4933 Special Topics in Zoology** (SU) Discussion of recent outstanding zoological research of interest to zoology majors and public school science teachers. May be repeated with different instructor of a maximum of 6 hours of credit. May be repeated for 6 hours. Prerequisite: 8 hours of biological sciences.

**ZOOL5514 Developmental Biology** (SP) An analysis of the concepts and mechanisms of development emphasizing the experimental approach. Corequisite: ZOOL 5510L.

**ZOOL5510L Development Biology Laboratory** (SP) Corequisite: ZOOL 5514.

**ZOOL5544 Comparative Vertebrate Embryology** (FA) Comparative study of the embryology of selected vertebrate types through the mammal with special emphasis on humans. Lecture 2, laboratory 6 hours per week. Corequisite: ZOOL 5540L.

**ZOOL5540L Comparative Vertebrate Embryology Laboratory** (FA) Corequisite: ZOOL 5544.

**ZOOL5643 Invertebrate Phylogeny** (SP, Even years) Introduction to the principles and practice of phylogeny reconstruction and rigorous evaluation of animal relationships inferred from molecular and morphological characters. Emphasis will be on high-level phylogeny of invertebrate taxa. Prerequisite: ZOOL 2814 or equivalent.

**ZOOL5723 Fish Biology** (SP, Odd years) Morphology, classification, life histories, population dynamics, and natural history of fishes and fish-like vertebrates. Lecture 2 hours, laboratory 3 hours per week. Corequisite: ZOOL 5720L. Prerequisite: 12 hours of biological sciences.

**ZOOL5720L Fish Biology Laboratory** (SP, Odd years) Corequisite: ZOOL 5723.

**ZOOL5733 Ichthyology** (FA, Even years) Taxonomy, systematics, and museum and collecting methods fresh-water fishes, concentrating on the fishes of North America. Lecture 2 hours, laboratory 1 hour per week. Corequisite: ZOOL 5730L. Prerequisite: ZOOL 2404 or equivalent.

**ZOOL5730L Ichthyology Laboratory** (FA, Even years) Corequisite: ZOOL 5733.

**ZOOL5743 Herpetology** (SP, Even years) Morphology, classification and ecology of amphibians and reptiles. Lecture 2 hours, laboratory 1 hour per week. Corequisite: ZOOL 5740L.

**ZOOL5740L Herpetology Laboratory** (SP, Even years) Corequisite: ZOOL 5743.

**ZOOL5763 Ornithology** (SP, Even years) Taxonomy, morphology, physiology, behavior, and ecology of birds. Lecture, laboratory, and field work. Corequisite: ZOOL 5760L. Prerequisite: 10 hours of biological sciences.

**ZOOL5760L Ornithology Laboratory** (SP, Even years) Corequisite: ZOOL 5763.

**ZOOL5783 Mammalogy** (IR) Lectures and laboratory

dealing with classification, morphology, distribution, ecology, behavior, and physiology of mammals. Corequisite: ZOOL 5780L.

**ZOOL5780L Mammalogy Laboratory** (IR) Corequisite: ZOOL 5783.

**ZOOL5814 Limnology** (FA, Odd years) Physical, chemical and biological conditions of inland waters. Lecture 3 hours per week, laboratory arranged. Corequisite: ZOOL 5810L. Prerequisite: (CHEM 1123 and CHEM 1121L) or equivalent and 12 hours of biological sciences.

**ZOOL5810L Limnology Laboratory** (FA, Odd years) Corequisite: ZOOL 5814.

**ZOOL5822 Animal Distribution** (FA, Even years) Physical, chronological, and biological factors affecting animal distribution, emphasizing terrestrial and fresh-water vertebrates.

**ZOOL5833 Animal Behavior** (FA, Odd years) Organization, regulation, and phylogeny of animal behavior, emphasizing vertebrates. Lecture, laboratory, and field work. Corequisite: ZOOL 5830L.

**ZOOL5830L Animal Behavior Laboratory** (FA, Odd years) Corequisite: ZOOL 5833.

**ZOOL5914 Stream Ecology** (FA, Even years) Current concepts and research in lotic ecosystem dynamics. Lecture, laboratory, field work and individual research projects required. Corequisite: ZOOL 5910L. Prerequisite: some previous course work in ecology is essential.

**ZOOL5910L Stream Ecology Laboratory** (FA, Even years) Corequisite: ZOOL 5914.

**ZOOL5922 Conservation of Endangered Species** (SP, Odd years) Biological, bureaucratic, and political reasons for protection of the nation's plants and animals. Conservation biology, ecology, population genetics, and legal implications of protecting selected species in ecosystem are discussed. Lecture 2 hours per week. Prerequisite: 12 hours of biological sciences.

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